

EFFECTS OF ANTIMONY MINING ON STREAM  
INVERTEBRATES AND PRIMARY PRODUCERS IN  
DENALI NATIONAL PARK, ALASKA

by

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EFFECTS OF ANTIMONY MINING ON STREAM INVERTEBRATES  
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A THESIS

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By

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## Abstract

Heavy metals, primarily antimony, arsenic and manganese from antimony mines in Denali National Park, Alaska impacted all levels of the stream ecosystem. Decreased algal, moss and macroinvertebrate abundance (but not changes in macroinvertebrate trophic organization) were all clearly associated with mining activity in Slate and Eldorado creeks. Crustacea, Chironomidae (Diptera), Hydracarina (Arachnida), Nemouridae (Plecoptera), and Zapada (Nemouridae) decreased in relative abundance with metal pollution while Capniidae (Plecoptera), Nemoura (Nemouridae), and Podmosta (Nemouridae) increased in relative abundance at mine sites. The data from Stampede Creek demonstrated that mineralized but unmined stream reaches may be impacted by heavy metals. Unexpectedly higher selenium levels upstream of the mine may account for the general lack of substantial differences in macroinvertebrates and periphyton upstream and downstream of the mine. However, macroinvertebrate and periphyton abundances were lower at both sites on Stampede Creek than at the unmined control stream, Jumbo Creek.



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## INTRODUCTION

While streams and rivers receive a tremendous variety of pollutants, heavy metals are of particular concern because they may be toxic at very low concentrations and are not biodegradable. Industrial and mining activities are common sources of heavy metal pollution. Contamination of drinking water supplies and food organisms is of direct concern to human health while changes in the community structure and productivity of aquatic food chains affect management of aquatic ecosystems.

Förstner and Wittmann (1981), Moore and Ramamoorthy (1984), and Whitton and Say (1975) collectively provide an excellent introduction to metal pollution in aquatic environments and the remarks below are largely derived from these sources. While there exists a large literature on heavy metals in aquatic ecosystems, several factors have severely hindered basic understanding of the ecological consequences of heavy metal pollution. Much research has been concerned with setting toxicity standards from a human perspective, e.g. allowable concentrations of heavy metals in drinking water or food organisms. The relevance of such standards to the protection of lotic organisms varies, with some aquatic organisms more sensitive than humans and some less so. Estimation of the environmental hazards of a particular chemical has largely been based upon single or, more recently, multiple species toxicity tests but such tests are unlikely to provide an adequate assessment of ecosystem consequences given the complexity of predator-prey and competitive interactions (Cairns 1983). Sorting out causal relationships in studies of perturbed ecosystems (e.g. upstream-downstream or even before and after comparisons) is likewise difficult. Both mining and industrial activities generally result in inputs of several heavy metals with the composite toxicity sometimes controlled by complex synergistic and antagonistic effects. Toxic effects and chemical speciation of metals are partially determined by physical and chemical factors

(e.g. temperature, pH, and hardness) so that changes in pH (common in acid mine situations) further complicate understanding. It seems likely that progress will depend upon increasingly sophisticated toxicity testing (tests of ecosystem structure and function) as described by Cairns (1983) as well as many more studies of perturbed ecosystems using recent technological, statistical and conceptual advances (Cairns and Pratt 1986).

Regions strongly dependent upon resource development for economic well-being (e.g Alaska) face the conflict of promoting mining while simultaneously insuring that other resource values (e.g. potable water, fisheries, and aesthetics) are not unacceptably impacted. Although heavy metal pollution is a frequent consequence of both placer and lode mining, very few studies have examined the consequences of metal pollution in Alaskan waters. E.V.S. consultants (1983) and Dames and Moore (1982) examined streams in the Red Dog Creek drainage, a site of extensive mineral deposits and potential mining. Natural inputs of several metals (aluminum, cadmium, iron, lead, and zinc) allowed examination of impacts on drinking water quality, benthic macroinvertebrate communities, and fish mortality. LaPerriere et al. (1985) examined heavy metal concentrations in streams subject to placer mining. Concentrations of arsenic, lead, zinc, and copper are significantly higher in placer mined streams than in streams never mined and below inactive mine sites. Algal standing crop and productivity is reduced in streams affected by placer mining (Van Niewenhuyse and LaPerriere 1986); macroinvertebrate density is reduced in response to water quality degradation (Wagener and LaPerriere 1985) and the Arctic grayling (Thymallus arcticus) avoids streams with high placer mining activity in the watershed (Simmons 1984). West (1982) and West and Deschu (1984) examined metal concentrations in the Kantishna Hills Region of Denali National Park and Preserve. Upstream-downstream

comparisons of heavy metal concentrations showed higher concentrations downstream of active mining in 83 % of comparisons although naturally high concentrations were found in some streams. Also in the Kantishna Hills, Brown and Oswood (1985) investigated benthic macroinvertebrates along a stream gradient associated with an inactive antimony mine and hypothesized that longitudinal changes in functional group and taxonomic composition were related to heavy metal concentrations. Clearly more extensive investigation of the effects of mining and heavy metal contamination is needed for realistic multiple use of Alaska's rivers and streams.

This study is concerned with the biological properties of streams associated with active and inactive antimony mines. Study sites were located in the Kantishna Hills region of Denali National Park and Preserve, Alaska (Figure 1). This region was incorporated into the park by the Alaska National Interest Lands Conservation Act of 1980. The Kantishna Hills region has been an area of active mining since the early 1900's of placer deposits of gold as well as lode deposits of antimony, copper, gold, lead, silver, and zinc (Bundtzen 1978). Continued mining within the new park boundary is controversial (Hunter 1985). In highly mineralized regions such as the Kantishna Hills, surface and ground waters may be naturally contaminated by heavy metals. However, oxidation and leaching of mine wastes may result in still higher inputs of heavy metals to streams. There are three antimony mines and 16 known antimony prospects in the Kantishna district, with antimony lodes found as stibnite-bearing quartz veins (Salisbury and Dietz 1984). I studied streams in the vicinity of two of these mines as well as a stream in a nearby region with no present or past mining. I hypothesized that both active and inactive antimony mines would be associated with decreases in abundance of both benthic macroinvertebrates and periphyton due to heavy metal (especially antimony) toxicity or other factors (e.g sedimentation). I further

hypothesized (see also Brown and Oswood 1985) that mining would be associated with changes in macroinvertebrate community structure, specifically a decrease in the relative proportion of grazers caused by a decrease in periphyton abundance.



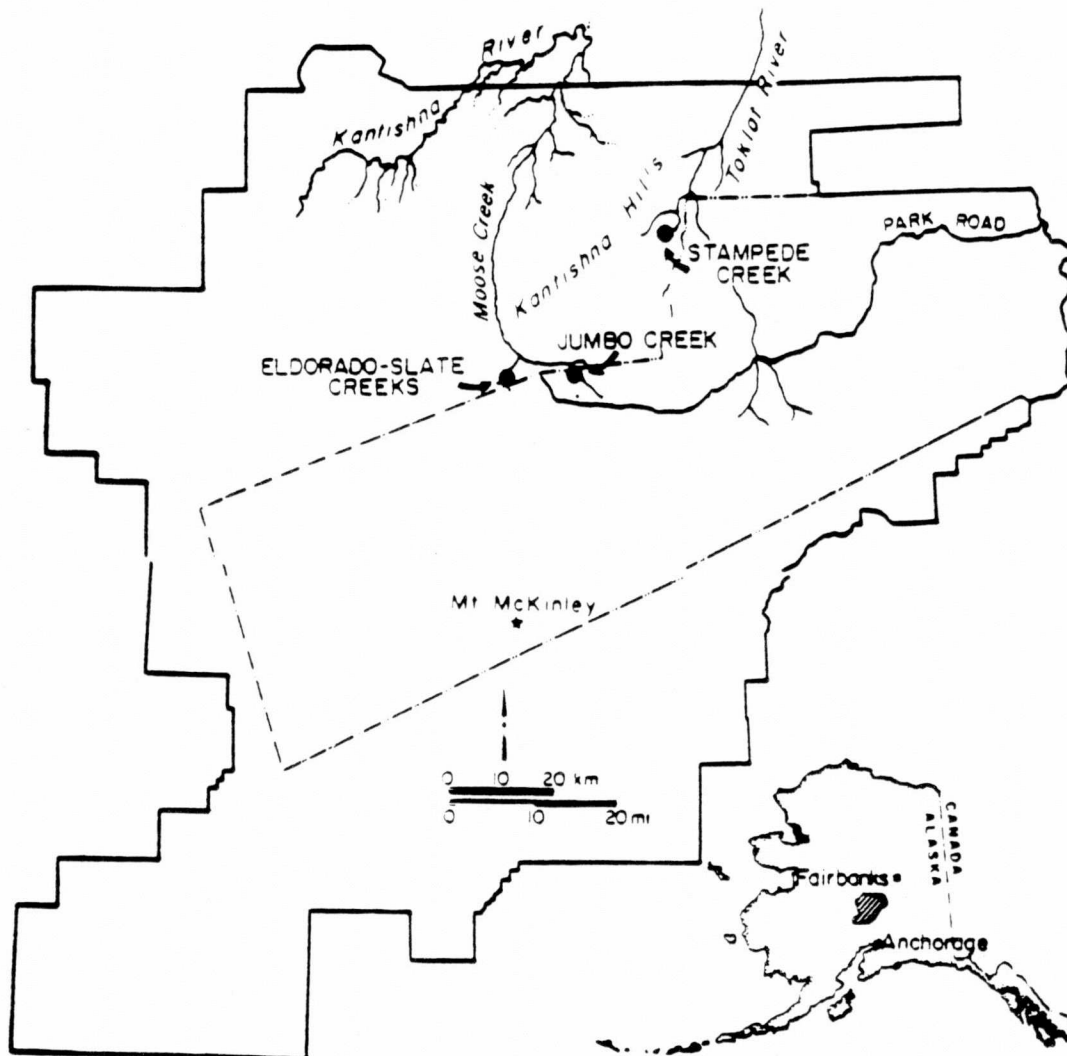


Figure 1. Location of Kantishna Hills study area. Dashed line indicates original boundary of Mr. McKinley National Park, now Denali National Park. Dark line indicates 1980 additions with Kantishna Hills in north. Study sites located on Eldorado, Slate, Jumbo and Stampede creeks.

## METHODS AND MATERIALS

### Study Site

The Kantishna Hills of Denali National Park and Preserve is a region of low mountains (maximum elevation approximately 1500 m) in the Kantishna River Basin. This basin is tributary to the Tanana River, in turn tributary to the Yukon River. The landscape and environmental features of the Kantishna hills are summarized below from detailed information in "Environmental Overview and Analysis of Mining Effects" (National Park Service 1981). Streams of the Kantishna Hills are clearwater (fed by precipitation and subsurface flow rather than glaciers) with maximum flow in spring (ice and snowmelt) or during heavy summer rains and minimum flow in early spring beneath ice cover. Winters are long and very cold with a yearly average air temperature of 24 °F (-4.4 °C). Stream drainages are dominated by bottomland spruce-hardwood forest consisting of open stands of white spruce (Picea glauca) with thick undergrowth of balsam poplar (Populus balsamifera), alder (Alnus crispa) and willow (Salix spp.). Shrub communities of alder, birch (Betula spp.) and willow as well as tundra communities occur at higher elevations and upper reaches of drainages.

The Eldorado and Slate creeks study site is located in an incised valley at approximately 610 m elevation (Figure 2). Slate Creek is a tributary of Eldorado Creek (Figure 2) and both are first order streams based on USGS (1: 63,360) maps (although Slate Creek has several small perennial tributaries and Eldorado Creek may have a small perennial tributary). An antimony lode mine (active summers of 1983 and 1985 but not 1984) is located at the headwaters of Slate Creek and mine spoil piles are present near the stream. The Slate Creek mine produced high-grade antimony ore as early as 1916 (Bundtzen 1978). Our study site on Slate Creek, approximately 3.5 km downstream

from the mine, was chosen to examine the direct effects of this antimony mine. Sample sites were located on Eldorado Creek and Slate Creek approximately 140 m and 70 m, respectively, upstream of the Slate Creek/Eldorado Creek confluence and 70 m downstream of the confluence (Figure 2). These sites are given throughout this report as Eldorado Creek, Slate Creek (m), and Eldorado Creek (m) where m = mined and indicates a site potentially affected by upstream mining. The Eldorado Creek site provides a paired comparison to Slate Creek (m) while the Eldorado Creek (m) site should be intermediate in characteristics due to mixture of Eldorado Creek and Slate Creek (m) waters. These three sites provide measures along a continuum of mining impacts from the heavily impacted Slate Creek (m) to Eldorado Creek (m) to unimpacted Eldorado Creek.

The Stampede Creek study site (Figure 3) is located at Stampede Mine (elevation approximately 610 m) approximately 56 km from the Eldorado/Slate Creek study sites. Although development of the antimony deposits at Stampede Creek began in 1916, active mining did not begin until 1936. During the late 1930's and early 40's, Stampede Mine "...accounted for a considerable percentage of U.S. domestic antimony production during this time" and by 1941 was the largest antimony producer in Alaska (Bundtzen 1978). Mining ceased during the early 1970's. A settling pond at the mine site is immediately adjacent to Stampede Creek and at times a small rivulet (pH 2.5) runs from the settling pond to the stream with noticeable discoloration of the stream substrates directly downstream. Sample sites were located approximately 140 m upstream and 100 m downstream of the mine site and are given in this report as Stampede and Stampede (m) respectively. The upstream site had no obvious disturbances but may have been affected by early placer mining (Bundtzen 1978) or mine construction activities or natural mineralization in the immediate area. Stampede Creek is a second order stream.

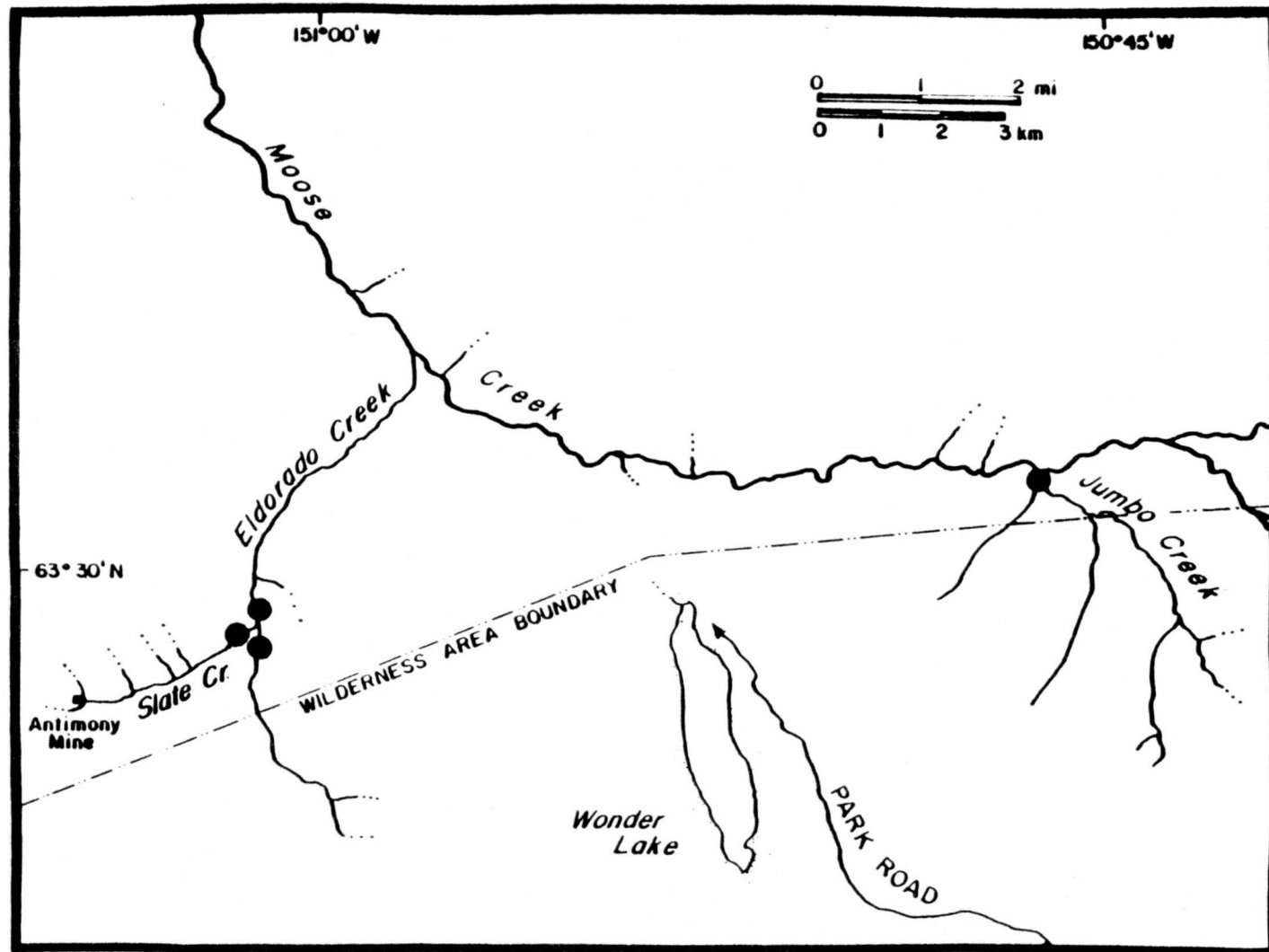


Figure 2. Map of Eldorado, Slate, and Jumbo creek study sites in Kantishna Hills,

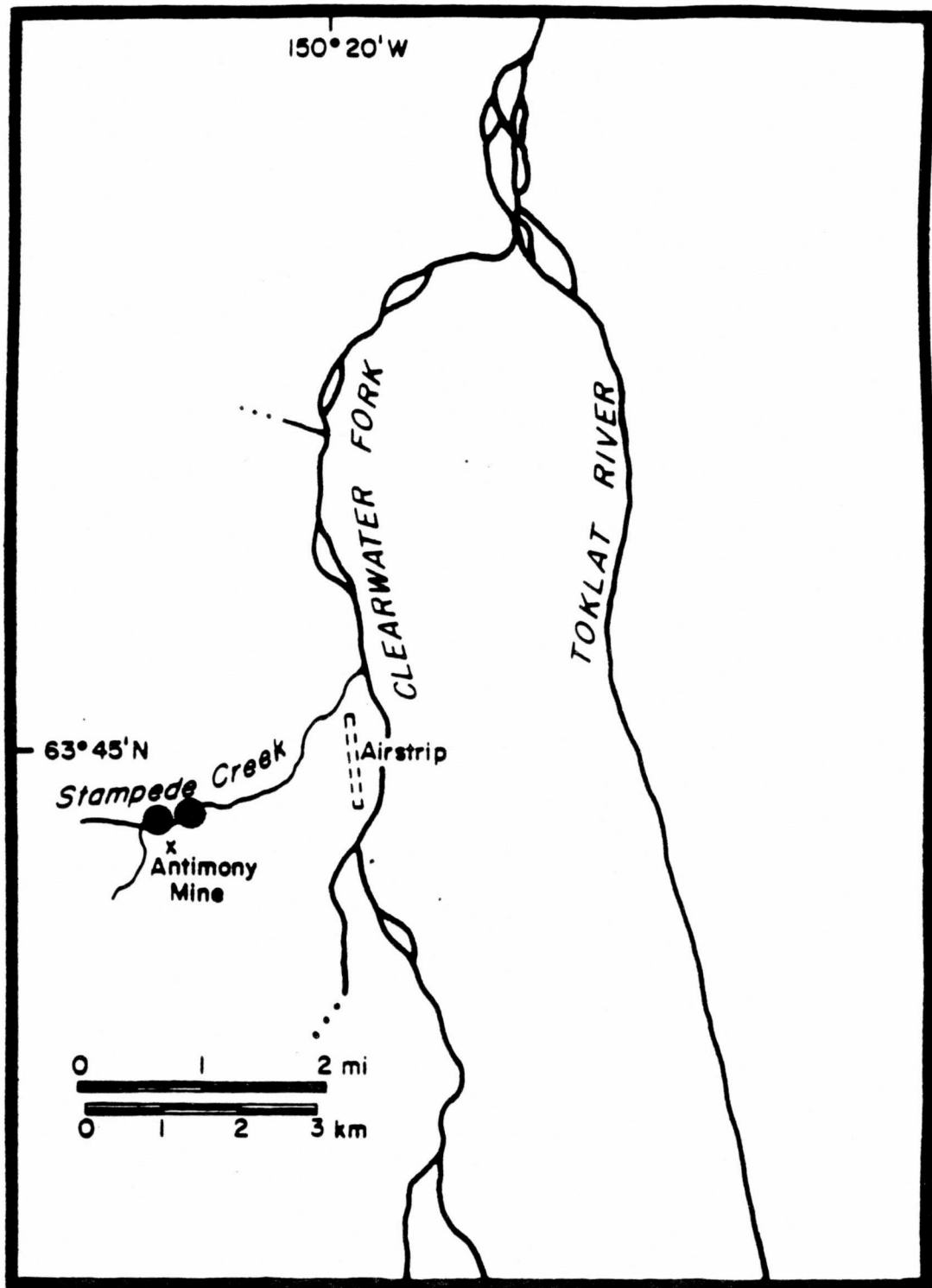


Figure 3. Map of Stampede Creek study sites in Kantishna Hills, Denali National Park, Alaska.

The Jumbo Creek study site (Figures 1 and 2) lies near Wonder Lake approximately 13.5 km east of Eldorado/Slate creeks (Figure 1). Site elevation is approximately 610 m and it is a third order stream according to USGS (1: 63,360) maps but I consider it (based on helicopter reconnaissance) to be a second order stream. No mining has taken place within the Jumbo Creek drainage and the region is relatively unmineralized compared to the Eldorado/Slate Creeks or Stampede Creek study sites (Salisbury and Dietz 1984). Jumbo Creek provides a comparison to the unmined sample sites in highly mineralized regions (Eldorado Creek and Stampede Creek).

Study sites at each stream were 30 m long and chosen to contain a range of stream habitats typical of that stream. Physical and chemical characteristics of the study sites are summarized below in Results.

### **Field Logistics**

Although the Slate/ Eldorado creek sites and the Jumbo Creek site can be reached by overland travel, road conditions are very severe and high water at stream crossings would frequently prevent access. Access to the Stampede Creek site is by fixed wing aircraft or helicopter only. Consequently, all travel to field sites was by helicopter. Helicopter flight was occasionally impossible leading to rescheduling of field work or loss of planned data from particular sites (discussed below).

### **Stream Characteristics**

Substrate characteristics at each study site were determined at 0.5 m intervals across the stream on transects spaced at 1 or 2 m intervals along the 30 m study sites. At each transect point the primary and secondary substrate particle type was visually determined with the primary particle type occupying the greatest surface area and the secondary particle type the next most surface area. Presence or absence of moss was

noted and percent embeddedness of large (cobble or boulder) particles by fines (sand/silt) was estimated similarly to methods of Platts et al. (1983). Stream width was determined on transects.

### **Water Chemistry**

There are several methods of measuring metals in stream waters. I measured total recoverable metals rather than dissolved or total metals in the water at our experimental sites. Total recoverable metals are those in solution after treatment with hot mineral acid (American Public Health Assoc. et al. 1981). EPA uses total recoverable metals as a basis for their water quality criteria because solubilities may differ substantially from one water body to another (Fed. Reg. 1980). Rather than measuring those metals that may be presently affecting the biota, total recoverable metals also include those that could become toxic (Fed. Reg. 1980). Use of either total or dissolved metals has disadvantages. Dissolved metals are defined as passing a 0.45  $\mu\text{m}$  filter (Florence 1982). Because metals must be in solution either as an ion or in an organic form to be transported across biological membranes (Cantillo & Segar, 1975) the toxic forms are primarily dissolved (Borgmann 1983). However, dissolved metal samples are easily contaminated making accurate measurement difficult (Florence 1980). Total heavy metals include portions which are never likely to be biologically available.

Water samples for analyses of total recoverable heavy metals (USEPA 1979, revised 1983) were taken in 500 ml acid-washed Nalgene™ plastic bottles rinsed twice in stream water at time of collection. Samples were taken during six sampling trips (16-18 June, 30 June-2 July, 21-23 July, 1-3 August, 1-3 September, 15-17 September) over the ice-free season in 1984. Samples were preserved in the field (immediately on trips 1 and 2, within 8 h on remaining trips) with 1.5 ml/L concentrated nitric acid per liter. Reagent grade acid was used on trip 1 and ultra-pure (Ultrex™) nitric acid on the

remaining trips. Samples were stored in a cooler at approximately 4 °C pending transport to the lab. Additionally, samples for mercury analyses were taken (as above, but in 1 L bottles) during the first trip only. Samples for mercury analyses were tested within 10 days while samples for analyses of other metals were held at 4 °C until the end of the field season. Samples were analyzed by Northern Testing Laboratories, Inc. of Fairbanks, Alaska. Dilutions of two high concentration and three low concentration check samples were made in reagent grade water and delivered along with the samples as an independent test of laboratory accuracy. In addition, three blanks of reagent grade water were delivered with the samples. Analyses for arsenic, antimony, cadmium, lead and selenium were performed on a Perkin-Elmer Model 603 atomic absorption spectrophotometer coupled with a HGA-2200 graphite furnace. Flame determinations of copper, chromium, iron, nickel, manganese, mercury, and zinc were made with a Perkin-Elmer HGA- 2380 atomic absorption unit. An extensive discussion of quality control for these heavy metal determinations is given in Appendix A. Metal concentrations as reported by Northern Testing Laboratories are given in Appendix B.

Temperature and pH were read at the study site with a Hach™ Model 19000 pH meter. Total alkalinity, and total hardness were measured in the field using Hach™ (digital titrator) methods. Turbidity was measured with a Hach™ Model 16800 Turbidimeter.

### **Benthic Macroinvertebrate Sampling and Processing**

Quantitative samples of benthic macroinvertebrates were taken during six sampling trips (16-18 June, 30 June-2 July, 21- 23 July, 1-3 August, 1-3 September, 15-17 September) over the ice-free season in 1984. Four random samples were taken at each study site on each trip for a total sample size of 144 (6 sample dates x 6 study sites x 4 samples/date/site). Macroinvertebrate samples were obtained with a Portable



Invertebrate Box Sampler (Ellis-Rutter Associates) with a surface area of  $0.1 \text{ m}^2$  and equipped with a  $350 \text{ }\mu\text{m}$  mesh net. Stream substrates were stirred to a depth of approximately 10 cm. Some substrates with extremely large (boulder) particles could not be sampled because of inadequate seal of the sampler to the substrate. Likewise, extremely shallow water habitats ( $< \text{approximately } 10 \text{ cm}$ ) could not be sampled because water could not flow through the collecting net. I attempted to obtain the coarse organic material (CPOM) and moss associated with each sample but did not vigorously remove moss remnants from rock surfaces.

Samples were preserved with Kahle's fluid (modified Carnoy's solution was used on one sampling trip). Macroinvertebrates were sorted from debris under a dissecting microscope and identified to the lowest practical taxonomic level using current taxonomic references (Merritt and Cummins 1984, Wiggins 1977, Pennak 1978) and unpublished material on stoneflies from Dr. K.W. Stewart (North Texas State University, Denton, Texas). Our macroinvertebrate identifications (to genus where possible) should be sufficient to assess the effects of heavy metals. While species identifications are preferable, they are often impossible because of immature specimens, or lack of identification keys. Genus is a useful taxonomic level in ecological studies of macroinvertebrates (Wiggins & Mackay, 1978) and may in fact contain most of the information of the species level (Waterhouse & Farrell, 1985).

Functional feeding group designations followed Merritt and Cummins (1984) as modified by Hawkins and Sedell (1981) and Hawkins et al. (1982). These modifications include addition of a "generalist" category to accommodate those taxa which feed on a wide variety of food resources and a combined collector/scrapper category. I confirmed functional group designations with data on gut contents of selected organisms from this study and other interior Alaskan sites (Appendix C).

CPOM was removed from benthic samples by wet sieving (1 mm sieve). Examination under a dissecting scope increased our estimate of the wet volume of CPOM in a moss-dominated Eldorado sample by approximately three-fold. Ash-free dry weights of CPOM and moss were determined by drying (50 °C) followed by ashing in a muffle furnace (500 °C).

### **Periphyton Sampling and Processing**

Periphyton abundance was estimated on artificial substrates using chlorophyll *a* as a measure of photosynthetic biomass. While periphyton abundance estimates derived from artificial substrates undoubtedly cannot represent those of the range of natural substrate types in a stream, the use of artificial substrates offers several advantages (American Public Health Assoc. 1985). Foremost of these advantages is ease of sample collection. The irregular surfaces of natural substrates generally makes quantitative collection of periphyton extremely difficult while artificial substrates provide a uniform, easily sampled surface. Our use of artificial substrates made possible rapid quantitative collections in the field and facilitated comparisons among study sites. Because I anticipated low abundance of periphyton at several study sites, I used large ( $\approx 11 \text{ cm} \times 11 \text{ cm} = 4" \times 4"$ ) plexiglass plates as substrates, rather than the more widely used (American Public Health Assoc. et al. 1980) glass microscope slides. Weitzel (1979) reviewed the common measures of periphyton abundance (ranging from cell counts and biomass/biovolume to phytopigment and ATP measurements). Phytopigments provide a simple and inexpensive measure of periphyton abundance but are not an exact equivalent of biomass since chlorophyll content can vary as a function of nutrients, light intensity, and age of cells (Weitzel 1979). Ash-free dry weight (AFDW) provides a rapid and widely used assessment of organic content of periphyton (including non-photosynthetic organic material).

Plexiglass™ plates were attached with screws to 2" x 4" ( $\approx 4 \times 9$  cm) wooden boards with the boards then anchored to the stream bed with concrete-reinforcing rod. Each plate was scribed so that half the surface area was sampled for chlorophyll analyses while the other half was sampled for periphyton ash-free dry weight (AFDW). Plate sets were randomly placed within each study site at locations sufficiently deep to allow  $\approx 3$  cm water over the plates. All plates were placed in the stream at the beginning (18-21 June 1985) of the ice-free season with four plates randomly selected for removal at each study site at 2-3 week intervals until the onset of "winter" (18-20 September). Occasionally weather conditions prevented sampling of some study sites on particular trips, and all plates remaining in the streams were collected on the final sampling trip on 18-20 September.

Following a five week colonization period, randomly selected plates (15 each site; 60 total) were transplanted from mined to unmined sites and vice versa. Plates were transplanted between Eldorado Creek and Slate Creek (m) and between Stampede Creek and Stampede Creek (m) and relocated randomly to open spots on the boards within the recipient stream. Four plates from each transplant group were then randomly sampled at 2-3 week intervals (with logistics limitations as above) for the remainder of the field season.

Periphyton was scraped from the upper surfaces of the plates with a razor blade. Periphyton samples destined for chlorophyll analyses were rinsed onto a 0.45  $\mu\text{m}$  membrane filter (Millipore™ HA) with 1 -2 ml saturated  $\text{MgCO}_3$  dripped onto the filters to prevent acid conditions which would convert chlorophyll to pheophytin (Golterman 1969). Filters were then folded into a large paper filter and placed into a dry-ice packed cooler (with desiccant) for transport from field to laboratory. Filters were stored (up to 3 months) frozen until analysis of chlorophyll content. Periphyton

destined for AFDW determinations was scraped onto pre-ignited glass fiber filters (Gelman™ type AE), sealed in pre-ignited aluminum foil wrappers and stored as above.

### Statistical Analyses

Many of the heavy metals (for a given site/date) occurred at concentrations below the detection limit of the analytical method used. These present a problem in data analyses since inequalities (e.g.  $< .001$  mg/L antimony) cannot be used in parametric statistical techniques. Data for some of the metals exhibit significant heterogeneity of sampling variances (among sample sites). This violates one of the assumptions of analysis of variance. For these reasons, I used non-parametric (ranked data) techniques to examine differences in heavy metal concentrations (as well as periphyton and macroinvertebrate abundances) among sample sites. Heavy metal concentrations below the detection limit (e.g.  $< 0.0010$  mg/L) were entered in data analyses as one unit lower (0.0009) which ranked concentrations **at** the detection limit higher than concentrations reported **below** the detection limit.

I compared heavy metal concentrations, periphyton abundance and macroinvertebrate abundance and composition among sample sites with particular attention to the following comparisons:

- (1) Eldorado Creek vs. Eldorado Creek (m) - a test of the effect of tributary input from a mined stream (Slate Creek),
- (2) Eldorado Creek vs. Slate Creek (m) - a test of differences between matched unmined and mined streams in the same watershed,
- (3) Stampede Creek vs. Stampede Creek (m) - a test of the effects of an inactive mine,

(4) Stampede Creek vs. Jumbo Creek - a test of differences between unmined control sites, and

(5) Eldorado Creek vs. Jumbo Creek - a test of differences between unmined control sites.

Comparisons were made by applying a rank transformation to the data and then using parametric statistical procedures (Conover and Iman 1981). I examined differences between sample sites using the Student-Newman-Keuhls multiple comparison test ( $p < 0.05$ ), as implemented on the SAS system statistical software (SAS Institute Inc. 1985).

## RESULTS

### Study Site Characteristics

Physical and chemical characteristics of the study sites are summarized in Table 1. All of the study sites were small cold water streams typical of interior Alaska although water temperatures in Slate Creek (m) were considerably warmer than the other study sites during the June to September field season. This may be due to the upstream decrease in riparian vegetation associated with mining. Hardness was higher in Slate Creek (m) than the unmined Eldorado Creek site while the Eldorado Creek (m) site was intermediate, as would be expected from the mixing of Eldorado Creek and Slate Creek (m) waters. Alkalinity was highest in Eldorado Creek, lowest in Slate Creek (m) with Eldorado Creek (m) again intermediate. Likewise, turbidity was highest in Slate Creek (m), lowest in Eldorado Creek and intermediate in Eldorado Creek (m). Hardness was much higher at the Stampede Creek study sites than at the other streams and Stampede Creek waters would be classified as "very hard" (Lind 1985). Jumbo Creek showed low alkalinity and hardness but somewhat higher turbidity than other sites (except Slate Creek (m)). However, turbidity levels at all six study sites were low and well within levels required for protection of fish and wildlife habitats in interior Alaska (Lloyd 1987). Although sites were chosen to have similar characteristics, because Jumbo Creek was wider than the other streams it had somewhat higher discharge.

Boulder and bedrock constituted a larger proportion of benthic substrate materials at Eldorado Creek than at any other site (Table 2). Slate Creek (m) showed a larger proportion of sand and silt substrates than other sites, possibly because of upstream mining activities (Table 2). Aquatic moss was present at Eldorado Creek and Jumbo Creek (averaging 53.2 mg/m<sup>2</sup> and 8.1 mg/m<sup>2</sup> respectively) but virtually absent

TABLE 1. CHEMICAL AND PHYSICAL CHARACTERISTICS OF THE STUDY SITES<sup>1</sup>

|                  | TEMP.<br>° C | ALKALINITY<br>mg/l CaCO <sub>3</sub> | TOTAL HARDNESS<br>mg/l CaCO <sub>3</sub> | TURBIDITY<br>N.T.U.'s | AVERAGE WIDTH<br>M |
|------------------|--------------|--------------------------------------|--|-----------------------|--------------------|
| ELDORADO CR (UM) | 3.7 ± 2.3    | 84 ± 8                               | 102 ± 10                                 | .70 ± .35             | 2.4                |
| SLATE CR (M)     | 8.0 ± 3.0    | 69 ± 6                               | 160 ± 12                                 | 2.8 ± .8              | 2.6                |
| ELDORADO CR (M)  | 4.4 ± 3.5    | 79 ± 9                               | 137 ± 19                                 | 2.1 ± 1.3             | 3.7                |
| STAMPEDE CR (UM) | 2.6 ± 1.4    | 106 ± 20                             | 287 ± 71                                 | 1.6 ± .9              | 2.6                |
| STAMPEDE CR (M)  | 2.4 ± 1.3    | 112 ± 18                             | 318 ± 80                                 | 1.9 ± 1.6             | 2.2                |
| JUMBO CR (U)     | 3.1 ± 1.9    | 69 ± 11                              | 81 ± 10                                  | 2.3 ± 1.9             | 6.9                |

<sup>1</sup> Water temperature and replicated (mean values used in statistical calculations) chemical determinations made during six (five for some variables) field trips over the ice-free season 1984. Mean values ± S.D. . Means and S.D.'s rounded to significant figures of original measurements. Turbidity measurements reported according to A.P.H.A. 1985, p. 136)

TABLE 2. % COMPOSITION OF SUBSTRATE MATERIALS

| PRIMARY <sup>1</sup> SUBSTRATE MATERIALS <sup>2</sup> |     |    |    |     |    |
|---|-----|----|----|-----|----|
| SITE  | B/B | CO | GR | S/S | WD |
| ELDORADO CR (UM)                                      | 45  | 38 | 16 | 0   | 1  |
| SLATE CR (M)  | 10  | 68 | 15 | 7   | 0  |
| ELDORADO CR (M)                                       | 12  | 52 | 25 | 1   | 1  |
| STAMPEDE CR (UM)                                      | 17  | 66 | 17 | 0   | 0  |
| STAMPEDE CR (M)                                       | 9   | 72 | 19 | 0   | 0  |
| JUMBO CR (U)  | 15  | 68 | 17 | 0   | 0  |

| SECONDARY SUBSTRATE MATERIALS |     |    |    |     |    |
|-------------------------------|-----|----|----|-----|----|
| SITE                          | B/B | CO | GR | S/S | WD |
| ELDORADO CR (UM)              | 45  | 6  | 41 | 6   | 1  |
| SLATE CR (M)                  | 9   | 0  | 43 | 48  | 0  |
| ELDORADO CR (M)               | 6   | 27 | 51 | 15  | 0  |
| STAMPEDE CR (UM)              | 10  | 34 | 56 | 0   | 0  |
| STAMPEDE CR (M)               | 6   | 51 | 43 | 0   | 0  |
| JUMBO CR (U)                  | 9   | 54 | 37 | 0   | 0  |

<sup>1</sup> Predominant and next most abundant (by surface area) particle types estimated at 0.5 m intervals across stream transects. Sample size ranges from 69 to 192.

<sup>2</sup> B/B = boulder/bedrock (bedrock or particle  $\geq 30$  cm), CO = cobble ( $\geq 6$ -7 cm,  $< 30$  cm), GR = gravel ( $< 6$ -7 cm,  $\geq 0.5$  cm), S/S = sand/silt ( $< 0.5$  cm), WD = woody debris



(< 1 mg/m<sup>2</sup>) at all other sites.

### **Heavy Metals**

Mercury levels at the sites ranged from <0.0002 to 0.0003 mg/L (N=6). Because levels appeared to be mostly below the detection limit of the method and had been similarly reported from previous study of streams in the area (West and Deschu 1984), and because analyses require separate sampling from other heavy metals (and are expensive), determinations were made only at the beginning of the field season.

Heavy metal concentrations at each study site are summarized in Figures 4-7 and compared to aquatic life water quality criteria (USEPA 1986). Results of comparisons ( $P < 0.05$ ) between sample sites (Figure 8) are summarized below. Those metals not appearing in Figure 8 showed no significant differences among sites. Antimony was significantly higher below the mine on Slate Creek than it was in Eldorado Creek, or downstream of the confluence in Eldorado Creek (m). These three stations at the Eldorado Creek site had significantly higher antimony than either site at Stampede Creek where antimony was not significantly higher below the abandoned antimony mine than above the mine. The Jumbo Creek control site was significantly lower in antimony than any of the stations in the two mined sites.

Manganese and arsenic followed similar patterns to that of antimony with the sites at Stampede Creek significantly lower in concentrations of both than at the mine-affected site at Slate Creek (m) and Eldorado Creek (m). The control site at Jumbo Creek had the lowest concentrations of both manganese and arsenic.

Lead and selenium were both significantly higher in concentration at the site above the abandoned mine on Stampede Creek. Jumbo Creek was significantly higher in lead concentration than any of the stations at the Slate/Eldorado creeks sites.

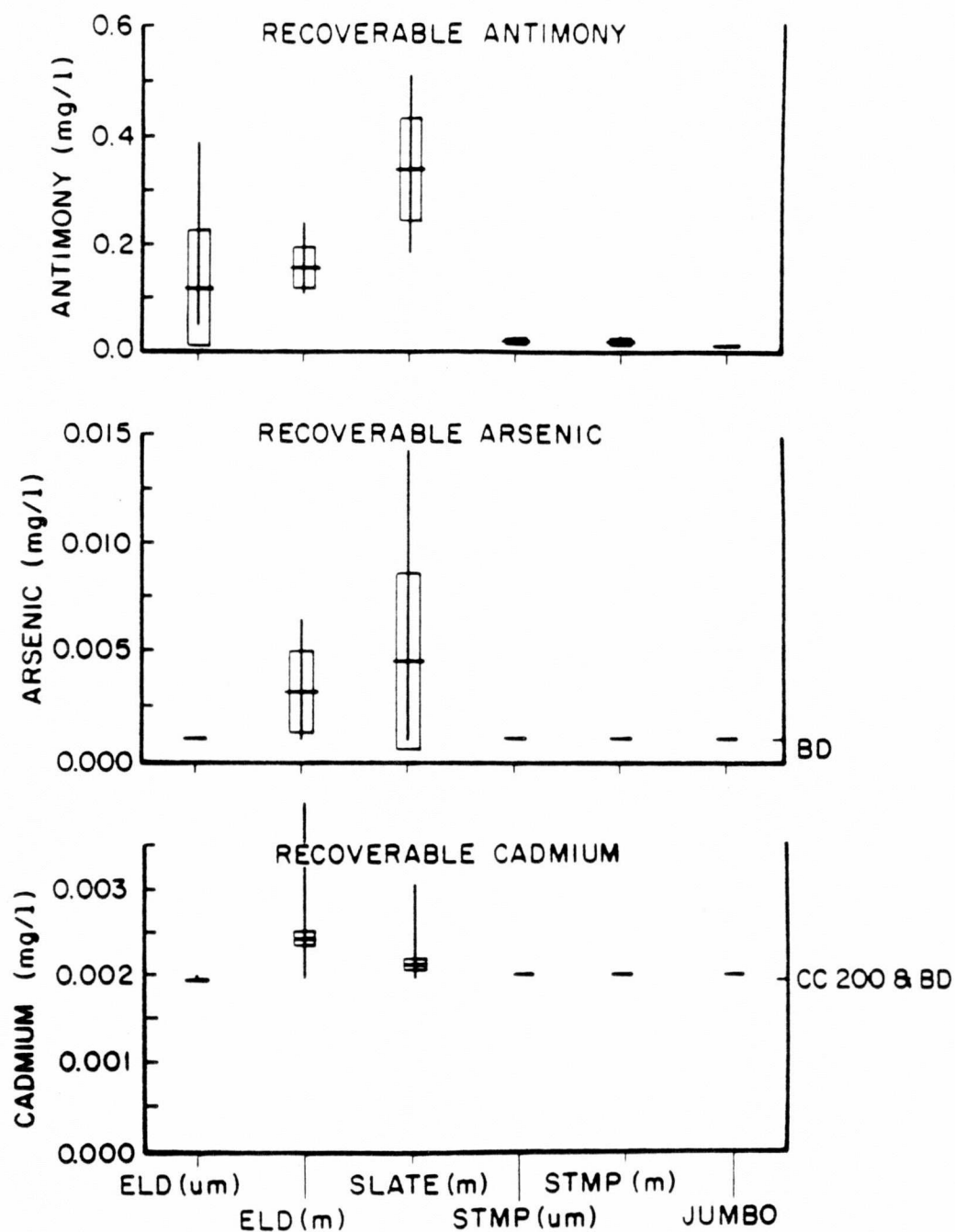


Figure 4. Mean, two standard errors, and range of recoverable antimony, arsenic, and cadmium at study sites. Eldorado (ELD), Slate, Stampede (STMP), and Jumbo creeks. (m) = mined site. (um) = unmined site. CC200 = the Environmental Protection Agency chronic criterion for protection of aquatic life at a hardness of 200 mg/l as  $\text{CaCO}_3$ . BD = below detection.

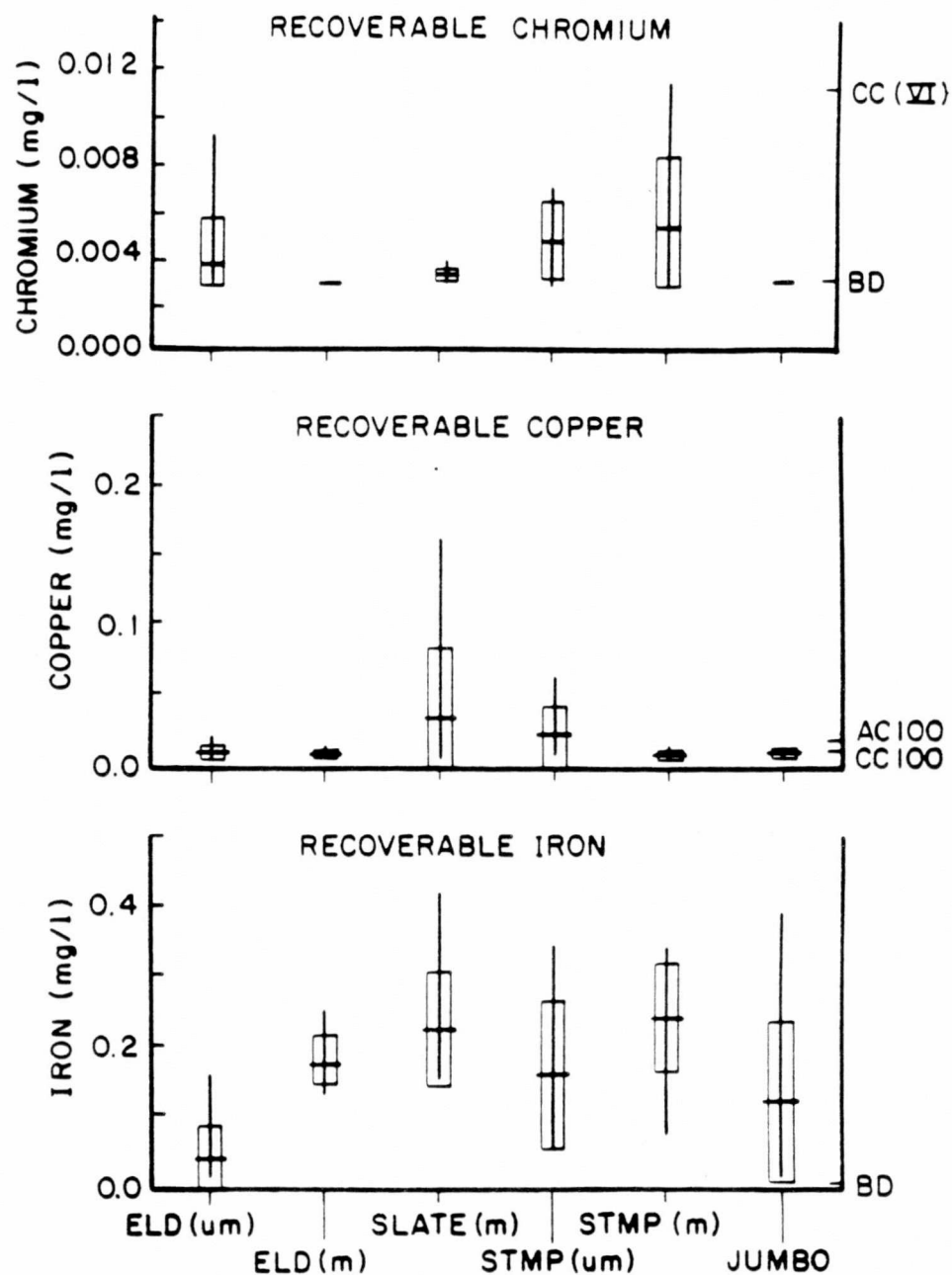


Figure 5. Recoverable chromium, copper and iron at study sites. CC(VI) = the chronic criteria for the +6 valence for the protection of aquatic life. AC100 = the acute criteria for the +6 valence for the protection of aquatic life at a hardness of 100 mg/l as CaCO<sub>3</sub>. Other abbreviations as in figure 4.

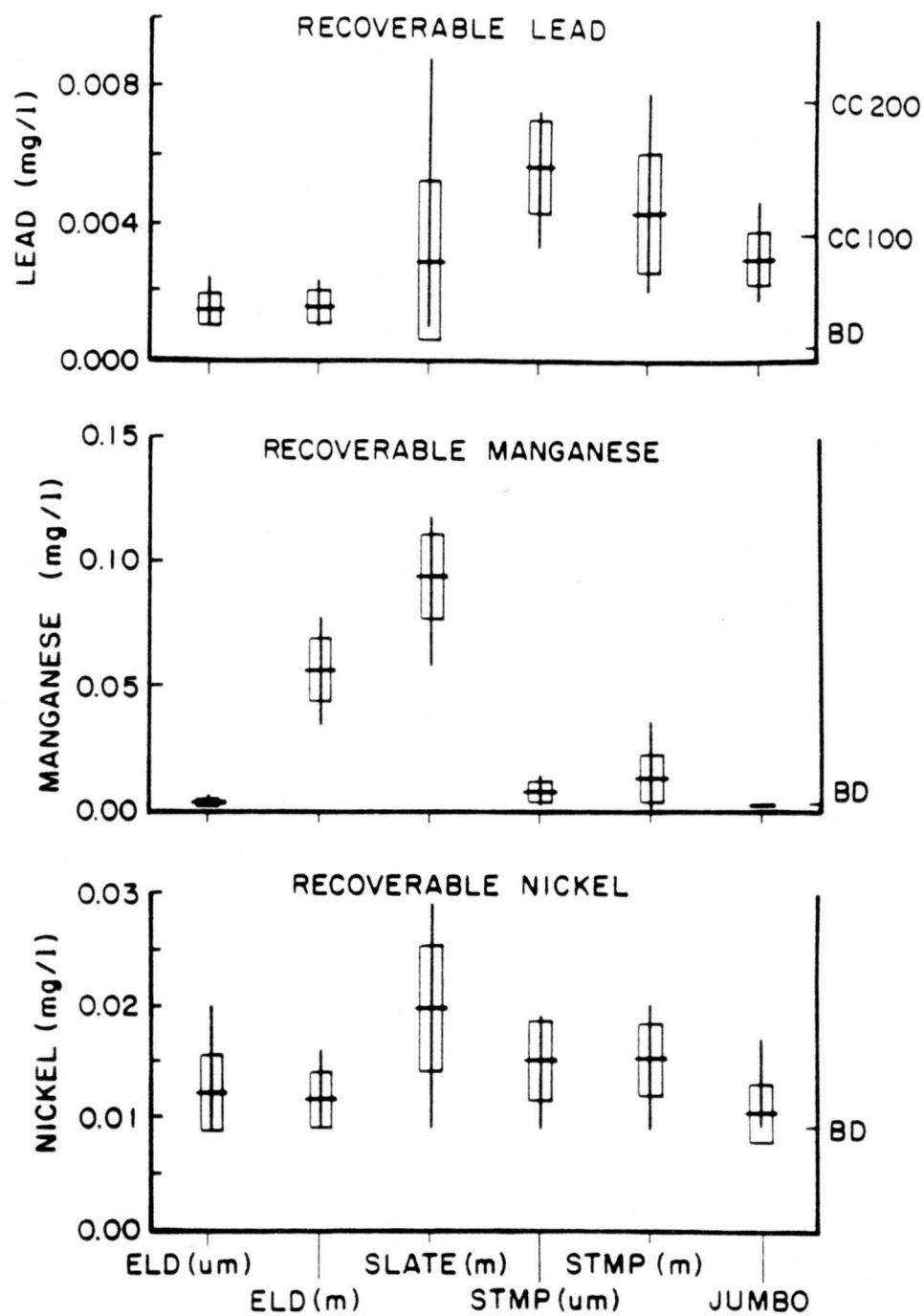


Figure 6. Recoverable lead, manganese and nickel at study sites. Abbreviations as in figure 4.

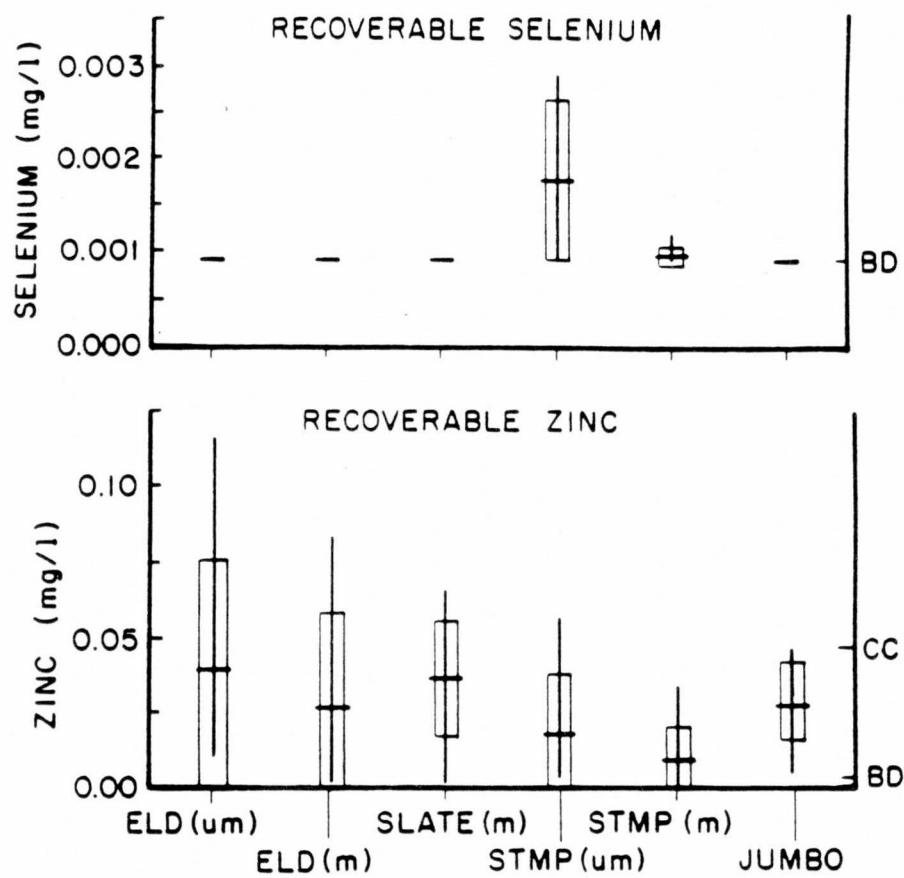


Figure 7. Recoverable selenium and zinc at study sites. Abbreviations as in figure 4.

| TOTAL RECOVERABLE METALS      |        |        |         |        |        |  |
|-------------------------------|--------|--------|---------|--------|--------|--|
| ARSENIC                       |        |        |         |        |        |  |
| SLT(m)                        | ELD(m) | ELD    | STP     | STP(m) | JMB    |  |
| ANTIMONY                      |        |        |         |        |        |  |
| SLT(m)                        | ELD(m) | ELD    | STP(m)  | STP    | JMB    |  |
| IRON                          |        |        |         |        |        |  |
| STP(m)                        | SLT(m) | ELD(m) | STP(um) | JMB    | ELD    |  |
| MANGANESE                     |        |        |         |        |        |  |
| SLT(m)                        | ELD(m) | STP(m) | STP     | ELD    | JMB    |  |
| LEAD                          |        |        |         |        |        |  |
| STP                           | STP(m) | JMB    | SLT(m)  | ELD(m) | ELD    |  |
| SELENIUM                      |        |        |         |        |        |  |
| STP                           | STP(m) | SLT(m) | ELD     | ELD(m) | JMB    |  |
| PERIPHYTON ABUNDANCE          |        |        |         |        |        |  |
| CHLOROPHYLL <sub>a</sub>      |        |        |         |        |        |  |
| JMB                           | ELD    | STP    | STP(m)  | ELD(m) | SLT(m) |  |
| FOOD AND SHELTER              |        |        |         |        |        |  |
| CPOM mg AFDW / m <sup>2</sup> |        |        |         |        |        |  |
| STP(m)                        | STP    | JMB    | ELD     | SLT(m) | ELD(m) |  |
| 22.3                          | 14.6   | 2.3    | 1.6     | 1.0    | 1.2    |  |
| MOSS mg AFDW / m <sup>2</sup> |        |        |         |        |        |  |
| ELD                           | JMB    | ELD(m) | SLT(m)  | STP    | STP(m) |  |
| 53.2                          | 8.1    | 0.7    | 0.3     | 0.0    | 0.0    |  |

Figure 8. Recoverable metals, periphyton abundance, coarse particulate organic matter (CPOM) and moss. Student-Newman-Kuels multiple comparison lines of at Eldorado (ELD), Slate (SLT), Stampede (STP), and Jumbo (JMB) Creeks. (m) = mined site. (um) = selenium at unmined site. Because analyses are based on ranked data, arithmetic means may not be sequential.

## Periphyton

Periphyton colonization (chlorophyll  $a/m^2$ ) at the study sites is shown in Figure 9. Overall differences between sample sites are very highly significant (one-way ANOVA,  $F = 63.9$ ,  $N = 6, 118$ ,  $P < 0.0001$ ). Pre-planned comparisons between sample sites indicate that periphyton abundance was significantly greater at Eldorado Creek than at either Eldorado Creek (m) or Slate Creek (m). Periphyton abundance did not differ significantly upstream and downstream of the inactive mine site at Stampede Creek. Periphyton abundance at Jumbo Creek was greater than at both Stampede Creek sites but Jumbo Creek and Eldorado Creek did not differ.

Following a five week colonization period, artificial substrates were reciprocally transferred between Eldorado Creek and Slate Creek (m) and between Stampede Creek and Stampede Creek (m) (Figure 9). Substrates transferred from Eldorado Creek to Slate Creek (m) showed a steady decrease in periphyton biomass while plates transferred from Slate Creek (m) to Eldorado Creek showed a simultaneous increase in periphyton abundance. Plates transferred both ways between Stampede Creek and Stampede Creek (m) showed similar biomass trends through time.

Patterns of periphyton abundance were consistent with patterns of heavy metals concentrations at the study sites. Slate Creek (m) showed the highest heavy metal contamination and lowest abundance of periphyton. Jumbo Creek showed the lowest heavy metal concentrations and the highest periphyton abundance. Eldorado Creek differs from Jumbo Creek only in significantly elevated concentrations of antimony and significantly lower concentrations of lead and showed no differences in abundance of periphyton. Sites upstream and downstream of the mine on Stampede Creek did not differ significantly in periphyton abundance but did differ in selenium concentration. Both the mined and unmined Stampede sites showed elevated heavy metals and lowered

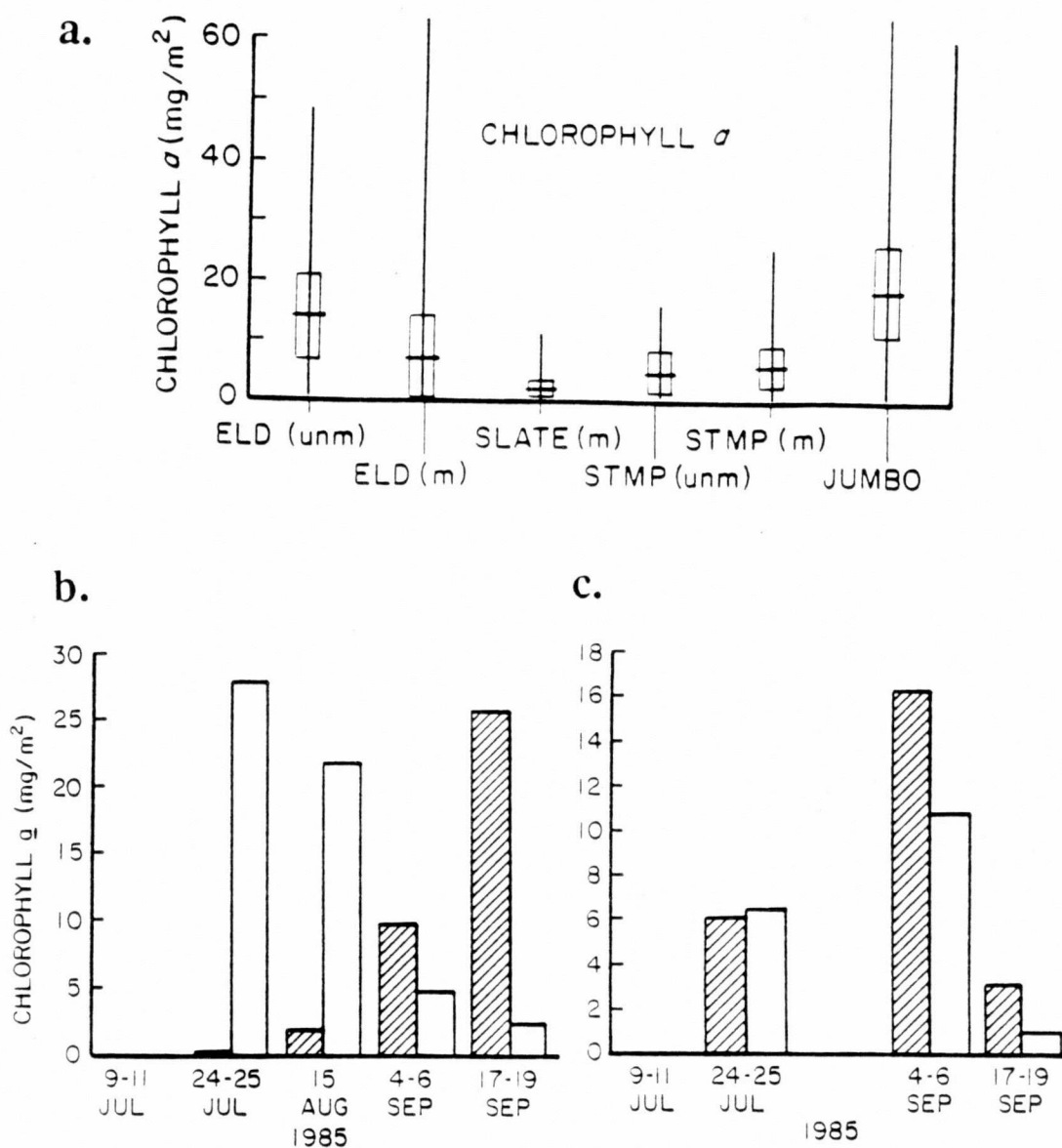


Figure 9. a. Chlorophyll  $a$  at study sites, Range (vertical line), two standard errors (box), and mean (horizontal line) at Eldorado (ELD), Slate, Stampede (STMP), and Jumbo creeks. (m) = mined site. (unm) = unmined site. b. Mean chlorophyll  $a$  of artificial substrates transferred between Slate and Eldorado creeks. Clear bars = transferred from Eldorado Cr. to Slate Cr. (m). Cross-hatched bars = transferred from Slate Cr. (m) to Eldorado Cr. c. Mean chlorophyll  $a$  of artificial substrates transferred between unmined and mined sites on Stampede Creek. Clear bars = transferred from unmined to mined site. cross-hatched bars = transferred from mined to unmined site.



periphyton abundance compared to Jumbo Creek. Transfer experiments confirm that Slate Creek (m) provides a poor environment for periphyton growth compared to Eldorado Creek but that the Stampede Creek sites do not differ from each other.

I found numerous Chironomidae larvae on periphyton substrates, as did Van Nieuwenhuysse & LaPerriere (1986). The Chironomidae increased the variability in ash-free dry weight biomass measures (but not chlorophyll *a* measures of periphyton biomass) so much that results were inconclusive and results are not reported.

### **Moss and Benthic Organic Materials**

Moss is more abundant in Eldorado Creek than at any other site (Figure 8). Abundance of moss at the Eldorado/Slate Creek sites followed the sequence Eldorado > Eldorado (m) > Slate Creek (m), consistent with expectations based upon mining impacts. Samples from both sites on Stampede Creek contained no measurable moss. Surprisingly, abundance of benthic CPOM was higher at the Stampede Creek sites than at all other sites (Figure 8) even though the riparian canopy seemed to be more highly developed at the Eldorado Creek site.

### **Macroinvertebrates**

I compared macroinvertebrate populations in several ways. Since percent occurrence calculations are based upon simple presence/absence data, strong or consistent patterns in percent occurrence data offer the possibility of classifying metal impacts on streams based upon easily obtained data. Densities (number/m<sup>2</sup>) indicate the actual number of organisms at each site. Relative abundance is the percent contribution of a taxon to a higher taxonomic group (e.g. percent of the family Nemouridae within the order Plecoptera) and is useful for comparing the taxonomic composition of streams of differing organism densities.

A list of taxa and percent occurrence of each taxon at each site is shown in Table

3. At the Eldorado Creek/Slate Creek study sites, one would expect highest percent occurrence values at the unmined Eldorado Creek site, lowest at the Slate Creek site, and intermediate at Eldorado Creek below the confluence. All genera of mayflies showed this pattern, as did Zapada (Plecoptera), Chelifera and Dicranota (Diptera), Ecclisomyia (Trichoptera), Ostracoda, Nematoda, and Hydracarina. Nemoura (Plecoptera) showed a striking reversal of this pattern, with higher percent occurrence at Slate Creek (m) and lowest percent occurrence at Eldorado Creek. At the Stampede Creek study sites, one would expect lower percent occurrence values at the sample site downstream from the inactive mine as opposed to the site above the mine. Instead, the number of taxa decreasing in percent occurrence from above to below the mine is almost identical to the number increasing, i.e. there appears to be no pattern whatsoever.

Jumbo Creek appeared to be similar to Eldorado Creek although several taxa were found at Jumbo Creek that were not found at Eldorado Creek including Drunella (Ephemeroptera), Neaviperla and Arcynopteryx (Plecoptera). In contrast, Nemoura and Prosimulium were found at all sites except Jumbo Creek. It seems likely that these differences in taxa occurrences represent simple biogeographic differences between watersheds rather than differences related to heavy metal concentrations. Percent occurrence values for most taxa were higher for Jumbo Creek than for Stampede Creek, probably due to the natural occurrence of selenium at the Stampede Creek site.

Densities (number/m<sup>2</sup>) of total organisms and major taxonomic groups at each site are shown in Figure 10 with site comparisons. Densities of macroinvertebrates were higher at each of the three sites not associated with mining (Eldorado Creek, Jumbo Creek, and Stampede Creek), than at any of the sites associated with mining. There was no significant difference in densities among the three mined sites. Densities

Table 3. Macroinvertebrate taxon presence as percent occurrence in 24 benthic samples taken at each site. (m) = mined.

| Unmined:<br>Mined:   | Eldorado |              | Stampede |           | Jumbo        |     |
|----------------------|----------|--------------|----------|-----------|--------------|-----|
|                      |          | Eldorado (m) |          | Slate (m) | Stampede (m) |     |
| <b>Ephemeroptera</b> |          |              |          |           |              |     |
| Baetidae             |          |              |          |           |              |     |
| Baetis               | 100      | 96           | 75       | 33        | 25           | 96  |
| Siphonuridae         |          |              |          |           |              |     |
| Ameletus             | 92       | 33           | 21       | 54        | 25           | 96  |
| Heptageniidae        |          |              |          |           |              |     |
| Epeorus              | 29       | 17           |          |           |              | 87  |
| Cinygmula            | 75       | 54           | 17       |           |              | 87  |
| unidentified         | 13       | 4            |          |           |              | 13  |
| Ephemerellidae       |          |              |          |           |              |     |
| Drunella             |          |              |          |           |              | 46  |
| <b>Plecoptera</b>    |          |              |          |           |              |     |
| Nemouridae           |          |              |          |           |              |     |
| Zapada               | 100      | 63           | 37       | 54        | 37           | 96  |
| Podmasta             | 8        | 33           | 13       | 67        | 87           | 21  |
| Nemoura              | 4        | 8            | 46       | 54        | 37           |     |
| Capniidae            |          |              |          |           |              |     |
| Capnia               | 8        | 17           | 13       | 54        | 58           | 37  |
| Chloroperlidae       |          |              |          |           |              |     |
| Alloperla            |          | 4            |          | 8         |              | 4   |
| Neaviperla           |          |              |          |           |              | 4   |
| Plumiperla           | 4        | 25           |          | 17        | 4            | 54  |
| unidentified         | 29       | 83           | 29       | 37        | 13           | 46  |
| Perlodidae           |          |              |          |           |              |     |
| Isoperla             | 8        |              |          | 13        | 21           | 25  |
| Arcynopteryx         |          |              |          | 4         | 4            | 29  |
| unidentified         | 58       | 8            | 4        | 21        | 25           | 50  |
| Taneniapterygidae    |          |              |          |           |              |     |
| Taenionema           |          |              |          | 13        |              |     |
| unidentified         |          | 13           | 4        | 21        | 8            | 8   |
| Leuctridae           |          |              |          |           |              |     |
| Perlomyia            |          |              |          |           | 4            |     |
| <b>Diptera</b>       |          |              |          |           |              |     |
| Ceratopogonidae      | 4        |              |          |           |              | 4   |
| Chironomidae larvae  | 100      | 100          | 100      | 96        | 100          | 100 |
| Chironomidae pupae   | 58       | 37           | 13       | 21        | 54           | 58  |
| Dolichopodidae       |          |              |          |           |              | 17  |
| Simuliidae           |          |              |          |           |              |     |
| Simulium             | 4        |              | 4        |           |              |     |
| Prosimulium          | 50       | 50           | 25       | 8         | 21           |     |
| Gymnopias            | 13       | 4            |          | 63        | 63           | 4   |
| Empididae            |          |              |          |           |              |     |
| Oreogeton            | 4        | 67           | 54       |           |              | 21  |
| Chelifera            | 50       | 21           | 13       | 4         |              | 4   |
| unidentified         |          | 13           | 13       | 4         |              | 13  |

|                          |     |     |     |     |     |     |
|--------------------------|-----|-----|-----|-----|-----|-----|
| Tipulidae                |     |     |     |     |     |     |
| Tipula                   | 8   | 4   | 4   | 25  | 24  | 4   |
| Gonomyodes               |     | 4   | 8   | 8   | 29  |     |
| Molophilus/Ormosia       | 21  |     |     |     |     |     |
| Pedicia                  | 4   | 4   |     |     |     |     |
| Dicranota                | 58  | 21  | 4   | 13  | 25  | 13  |
| unidentified             |     | 13  | 13  | 4   |     | 13  |
| Stratiomyidae            | 4   | 4   |     |     |     |     |
| Psychodidae              | 42  | 33  | 42  | 17  | 25  | 33  |
| (Pericoma/Telmatoscopus) |     |     |     |     |     |     |
| Trichoptera              |     |     |     |     |     |     |
| Limnephilidae            |     |     |     |     |     |     |
| Ecclisomyia              | 29  | 8   | 4   |     |     | 29  |
| Apatania                 | 4   |     |     |     |     | 13  |
| Rhyacophilidae           |     |     |     |     |     | 13  |
| Ostracoda                | 96  | 54  | 21  | 4   | 17  | 100 |
| Nematoda                 | 42  | 13  | 4   | 8   | 21  | 8   |
| Oligochaeta              | 100 | 100 | 100 | 100 | 100 | 100 |
| Platyhelminthes          | 96  | 63  | 67  | 37  | 54  | 83  |
| Hydracarina              | 96  | 29  | 13  | 17  | 25  | 96  |
| Collembola               | 92  | 63  | 71  | 50  | 25  | 21  |
| Copepoda                 |     |     | 4   |     |     |     |

DENSITY    NUMBERS / M<sup>2</sup>

MACROINVERTEBRATES

| ELD    | JMB    | STP   | STP(m) | ELD(m) | SLT(m) |
|--------|--------|-------|--------|--------|--------|
| 40,035 | 11,142 | 1,380 | 886    | 794    | 654    |

INSECTS

| ELD    | JMB   | STP   | STP(m) | ELD(m) | SLT(m) |
|--------|-------|-------|--------|--------|--------|
| 33,090 | 6,232 | 1,362 | 859    | 745    | 640    |

NON-INSECTS

| ELD   | JMB   | ELD(m) | STP(m) | STP | SLT(m) |
|-------|-------|--------|--------|-----|--------|
| 6,945 | 4,904 | 49     | 27     | 19  | 14     |

OSTRACODA

| ELD   | JMB   | ELD(m) | SLT(m) | STP(m) | STP(s) |
|-------|-------|--------|--------|--------|--------|
| 5,368 | 4,234 | 23     | 4      | 2      | 0.4    |

HYDRACARINA

| ELD | JMB | ELD(m) | STP | STP(m) | SLT(m) |
|-----|-----|--------|-----|--------|--------|
| 610 | 246 | 6      | 2   | 3      | 1      |

NEMATODA

| ELD | STP(m) | ELD(m) | JMB | STP | SLT(m) |
|-----|--------|--------|-----|-----|--------|
| 59  | 3      | 2      | 1   | 2   | 1      |

PLATYHELMINTHES

| ELD | JMB | ELD(m) | STP(m) | STP | SLT(m) |
|-----|-----|--------|--------|-----|--------|
| 907 | 428 | 18     | 18     | 16  | 7      |

DIPTERA

| ELD    | JMB   | STP | STP(m) | ELD(m) | SLT(m) |
|--------|-------|-----|--------|--------|--------|
| 29,236 | 3,477 | 656 | 519    | 359    | 413    |

DIPTERA CHIRONOMIDAE

| ELD    | JMB   | STP | STP(m) | ELD(m) | SLT(m) |
|--------|-------|-----|--------|--------|--------|
| 28,872 | 3,348 | 599 | 445    | 307    | 353    |

EPHEMEROPTERA

| ELD   | JMB  | ELD(m) | SLT(m) | STP | STP(m) |
|-------|------|--------|--------|-----|--------|
| 2,475 | 2015 | 227    | 103    | 45  | 17     |

PLECOPTERA

| ELD   | JMB | STP | STP(m) | ELD(m) | SLT(m) |
|-------|-----|-----|--------|--------|--------|
| 1,283 | 700 | 647 | 320    | 131    | 106    |

TRICHOPTERA

| JMB | ELD | ELD(m) | SLT(m) | STP | STP(m) |
|-----|-----|--------|--------|-----|--------|
| 26  | 26  | 1.7    | 0.8    | -   | -      |

COLLEMBOLA

| ELD | ELD(m) | SLT(m) | JMB | STP | STP(m) |
|-----|--------|--------|-----|-----|--------|
| 68  | 26     | 18     | 14  | 14  | 4      |

Figure 10. Density (numbers per square meter) of major macro-invertebrate taxa. Student-Newman-Kuels multiple comparison lines at Eldorado (ELD), Slate (SLT), Stampede (STP), and Jumbo (JMB) Creeks. (m) = mined site. Because analyses are based on ranked data arithmetic means may not be sequential.

are highest at Eldorado Creek, followed by Jumbo Creek followed in turn by Stampede Creek. Average density at Eldorado was 40,035 organisms/m<sup>2</sup> with one sample containing 111,142/m<sup>2</sup>. These densities are high, even in comparison to temperate streams (see Cowan and Oswood 1984, Fig. 4). Site comparisons for total insects followed the same patterns described above for total macroinvertebrates. Densities of non-insect invertebrates, especially Ostracoda, Hydracarina and Platyhelminthes, were strikingly higher (by two orders of magnitude) at the unmined Eldorado Creek and Jumbo Creek sites than at all other sites.

Additionally, non-insect invertebrates constituted a larger proportion of the fauna at the unmined Eldorado Creek and Jumbo Creek sites (Figure 11). Patterns in the proportional contributions of major taxa (Figures 11 and 12) are somewhat more difficult to interpret. Diptera and Chironomidae constituted a larger proportion of the insect fauna at unmined Eldorado Creek than at all other sites. Ephemeroptera were in significantly lower proportional abundance at the Stampede Creek sites while conversely Plecoptera constitute a significantly higher proportion at the Stampede sites. Trichoptera are a small proportion of the fauna at all sites but show the the largest proportional representation at the unmined Eldorado Creek and Jumbo Creek sites.

I hypothesized that functional group composition of the stream benthos would mirror differences in food resources among stream sites. In particular, I suggested that mining would decrease abundance of periphyton and hence the absolute and proportional abundance of scraper (grazer) invertebrates. Scrapers showed their highest proportion at unmined Jumbo Creek and their lowest at unmined Eldorado Creek. Periphyton abundance on artificial substrates was highest at Jumbo and Eldorado Creeks. High relative abundance of scrapers at Jumbo Creek is consistent with food abundance but the low proportional abundance at Eldorado Creek is not. It is possible

# INSECTS / TOTAL MACROINVERTEBRATES

---

| STP(um) | SLT(m) | STP(m) | ELD(m) | ELD | JMB |
|---------|--------|--------|--------|-----|-----|
| .99     | .98    | .94    | .94    | .76 | .63 |

# NON-INSECTS / TOTAL MACROINVERTEBRATES

---

| JMB | ELD | ELD(m) | STP(m) | SLT(m) | STP(um) |
|-----|-----|--------|--------|--------|---------|
| .24 | .37 | .06    | .06    | .02    | .01     |

# OSTRACODA / TOTAL MACROINVERTEBRATES

---

| JMB | ELD | ELD(m) | SLT(m) | STP(m) | STP(um) |
|-----|-----|--------|--------|--------|---------|
| .30 | .20 | .03    | .01    | .01    | .00     |

# DIPTERA / TOTAL INSECTS

---

| ELD | SLT(m) | JMB | STP(m) | ELD(m) | STP(m) |
|-----|--------|-----|--------|--------|--------|
| .82 | .62    | .59 | .55    | .50    | .47    |

# DIPTERA CHIRONOMIDAE / TOTAL INSECTS

---

| ELD | JMB | SLT(m) | STP(m) | STP(um) | ELD(m) |
|-----|-----|--------|--------|---------|--------|
| .81 | .56 | .49    | .46    | .43     | .42    |

# DIPTERA CHIRONOMIDAE / TOTAL DIPTERA

---

| ELD | JMB | STP(um) | STP(m) | ELD(m) | SLT(m) |
|-----|-----|---------|--------|--------|--------|
| .98 | .92 | .90     | .82    | .84    | .79    |

EPHEMEROPTERA / TOTAL INSECTS

| JMB | ELD(m) | SLT(m) | ELD | STP(um) | STP(m) |
|-----|--------|--------|-----|---------|--------|
| .28 | .26    | .19    | .13 | .03     | .02    |

PLECOPTERA / TOTAL INSECTS

| STP(um) | STP(m) | ELD(m) | JMB | SLT(m) | ELD |
|---------|--------|--------|-----|--------|-----|
| .49     | .43    | .19    | .13 | .13    | .05 |

TRICHOPTERA / TOTAL INSECTS

| JMB  | ELD  | ELD(m) | SLT(m) | STP(um) | STP(m) |
|------|------|--------|--------|---------|--------|
| .005 | .001 | .002   | .001   | .000    | .000   |

COLLEMBOLA / TOTAL INSECTS

| SLT(m) | ELD(m) | ELD  | STP(um) | JMB  | STP(m) |
|--------|--------|------|---------|------|--------|
| .059   | .047   | .004 | .014    | .003 | .005   |

Figure 11. Relative abundance of major macroinvertebrate taxa at Eldorado (ELD), Slate (SLT), Stampede (STP) and Jumbo (JMB) Creeks. (m) = mined site. (um) = unmined site. Because analyses are based on ranked data arithmetic means may not be sequential.



## RELATIVE ABUNDANCE OF SELECTED TAXA

## CAPNIIDAE / PLECOPTERA

---

| STP(m) | STP(um) | SLT(m) | ELD(m) | JMB  | ELD  |
|--------|---------|--------|--------|------|------|
| .560   | .525    | .255   | .117   | .055 | .004 |

## CHLOROPERLIDAE / PLECOPTERA

---

| ELD(m) | JMB  | SLT(m) | STP(um) | ELD  | STP(m) |
|--------|------|--------|---------|------|--------|
| .511   | .111 | .051   | .029    | .020 | .003   |

## NEMOURIDAE / PLECOPTERA

---

| ELD  | JMB  | SLT(m) | STP(um) | STP(m) | ELD(m) |
|------|------|--------|---------|--------|--------|
| .944 | .790 | .598   | .407    | .378   | .291   |

## NEMOURA / NEMOURIDAE

---

| SLT(m) | STP(um) | STP(m) | ELD(m) | ELD  | JMB |
|--------|---------|--------|--------|------|-----|
| .443   | .226    | .194   | .082   | .001 | A   |

## PODMOSTA / NEMOURIDAE

---

| STP(m) | STP(um) | ELD(m) | SLT(m) | JMB  | ELD  |
|--------|---------|--------|--------|------|------|
| .665   | .517    | .204   | .044   | .006 | .003 |

## ZAPADA / NEMOURIDAE

---

| ELD  | JMB  | ELD(m) | SLT(m) | STP(um) | STP(m) |
|------|------|--------|--------|---------|--------|
| .992 | .924 | .667   | .294   | .091    | .051   |

## SIPHONURIDAE / EPHEMEROPTERA

---

| STP(um) | JMB  | STP(m) | ELD  | ELD(m) | SLT(m) |
|---------|------|--------|------|--------|--------|
| .609    | .235 | .448   | .223 | .088   | .036   |

## HEPTAGENIIDAE / EPHEMEROPTERA

---

| JMB  | ELD  | ELD(m) | SLT(m) | STP(um) | STP(m) |
|------|------|--------|--------|---------|--------|
| .316 | .044 | .123   | .017   | -       | -      |

## BAETIDAE / EPHEMEROPTERA

---

| SLT(m) | ELD(m) | ELD  | STP(m) | STP(um) | JMB  |
|--------|--------|------|--------|---------|------|
| .948   | .790   | .733 | .452   | .391    | .361 |

Figure 12. Relative abundance of selected macroinvertebrate taxa. Student-Newman-Kuels multiple comparison lines at Eldorado (ELD), Slate (SLT), Stampede (STP), and Jumbo (JMB) Creeks. (m) = mined.. Analyses are based on ranked data; arithmetic means may not be sequential.

that the extensive moss development at Eldorado Creek provides a relatively poor substrate for scrapers, even though potential periphyton abundance (as determined on artificial substrates) is high. Absolute abundance of scrapers is significantly higher at Eldorado Creek and Jumbo Creek, consistent with patterns of periphyton abundance. Shredders are likewise at highest absolute abundance at the unmined Eldorado Creek and Jumbo Creek sites. However, the proportional contribution of shredders to macroinvertebrate communities is highest at the Stampede Creek sites, consistent with higher CPOM abundance. Collector abundance (both absolute and proportional) is higher at the unmined Eldorado Creek and Jumbo Creek sites than at all other sites. Density of predators was significantly higher at Eldorado Creek and Jumbo Creek (Figure 13). Predators showed no significant differences in proportional contributions among sites (Figure 14). Proportions of predators ranged from 0.039 to 0.158 at the study sites. Generalists and filterers constituted very small proportions of the macroinvertebrate fauna and showed few differences among sites although the absolute abundance of generalists was highest at the unmined Eldorado and Jumbo creek sites.

FUNCTIONAL GROUPS  
DENSITY, NUMBERS PER SQUARE METER

PREDATORS

| ELD   | JMB | ELD(m) | STP(m) | STP(um) | SLT(m) |
|-------|-----|--------|--------|---------|--------|
| 1,581 | 741 | 60     | 36     | 33      | 29     |

COLLECTORS

| ELD   | JMB   | ELD(m) | SLT(m) | STP(um) | STP(m) |
|-------|-------|--------|--------|---------|--------|
| 5,983 | 5,378 | 96     | 47     | 60      | 17     |

SHREDDERS

| ELD   | JMB | STP(um) | STP(m) | ELD(m) | SLT(m) |
|-------|-----|---------|--------|--------|--------|
| 1,226 | 551 | 365     | 153    | 50     | 66     |

FILTERERS

| ELD | JMB | ELD(m) | SLT(m) | STP(m) | STP(um) |
|-----|-----|--------|--------|--------|---------|
| 135 | 16  | 9      | 10     | 4      | 13      |

SCRAPERS

| JMB | ELD | STP(um) | ELD(m) | STP(m) | SLT(m) |
|-----|-----|---------|--------|--------|--------|
| 680 | 180 | 45      | 36     | 31     | 21     |

GENERALISTS

| ELD | JMB | STP(m) | STP(um) | ELD(m) | SLT(m) |
|-----|-----|--------|---------|--------|--------|
| 83  | 50  | 8      | 5       | 3      | 2      |

IMMATURES

| ELD   | ELD(m) | JMB | STP(um) | STP(m) | SLT(m) |
|-------|--------|-----|---------|--------|--------|
| 1,840 | 227    | 271 | 274     | 164    | 101    |

COLLECTORS + IMMATURES

| ELD   | JMB   | ELD(m) | STP(um) | STP(m) | SLT(m) |
|-------|-------|--------|---------|--------|--------|
| 7,793 | 5,648 | 323    | 334     | 181    | 149    |

Figure 13. Density (mean numbers per square meter) of macroinvertebrate functional groups. Student-Newman-Kuels multiple comparison lines at Eldorado (ELD), Slate (SLT), Stampede (STP), and Jumbo (JMB) creeks. (m) = mined site. (um) = unmined. Because analyses are based on ranked data arithmetic means may not be sequential.

## RELATIVE ABUNDANCE

## PREDATORS

| ELD(m) | ELD  | JMB  | STP(m) | SLT(m) | STP(um) |
|--------|------|------|--------|--------|---------|
| .158   | .132 | .118 | .107   | .118   | .039    |

## COLLECTORS

| JMB  | ELD  | ELD(m) | SLT(m) | STP(um) | STP(m) |
|------|------|--------|--------|---------|--------|
| .605 | .530 | .243   | .242   | .069    | .047   |

## SHREDDERS

| STP(um) | STP(m) | ELD  | JMB  | SLT(m) | ELD(m) |
|---------|--------|------|------|--------|--------|
| .541    | .453   | .124 | .128 | .154   | .085   |

## FILTER FEEDERS

| ELD(m) | ELD  | JMB  | SLT(m) | STP(m) | STP(um) |
|--------|------|------|--------|--------|---------|
| .022   | .016 | .006 | .039   | .008   | .013    |

## SCRAPERS

| JMB  | ELD(m) | SLT(m) | STP(um) | STP(m) | ELD  |
|------|--------|--------|---------|--------|------|
| .081 | .090   | .097   | .050    | .057   | .033 |

## GENERALISTS

| JMB  | ELD  | STP(m) | STP(um) | ELD(M) | SLT(m) |
|------|------|--------|---------|--------|--------|
| .017 | .006 | .035   | .006    | .007   | .007   |

## IMMATURES

| ELD(m) | SLT(m) | STP(m) | STP(um) | ELD  | JMB  |
|--------|--------|--------|---------|------|------|
| .393   | .290   | .292   | .282    | .159 | .045 |

## COLLECTORS AND IMMATURES

| ELD  | JMB  | ELD(m) | SLT(m) | STP(um) | STP(m) |
|------|------|--------|--------|---------|--------|
| .689 | .649 | .636   | .532   | .350    | .340   |

Figure 14. Relative abundance of macroinvertebrate functional groups. Student-Newman-Kuels multiple comparison lines at Eldorado (ELD), Slate (SLT), Stampede (STP), and Jumbo (JMB) Creeks. (m) = mined site. (um) = unmined. Because analyses are based on ranked data arithmetic means may not be sequential.

## DISCUSSION

### Metals

Many of the metals that were analyzed were found at all stations at low concentrations, near the detection limit of the method (arsenic, cadmium, chromium, copper, mercury, nickel, and selenium). Additionally, the number of samples (5 or 6) at each station was low, and the timing of sampling was based upon regular sampling trips rather than variation in stream flow. Nonetheless, several discoveries were made concerning metal concentrations in these streams.

Increasing levels of recoverable antimony, arsenic, and manganese were associated with decreasing invertebrate and periphyton abundance. The elevated antimony in Slate Creek probably resulted from the mining activity of the previous summer. Our data indicate that manganese may be associated with antimony mining activity since it was significantly elevated in Slate Creek (m) and Stampede Creek (m). Mean chlorophyll *a* levels decreased by an order of magnitude (figure 9) and invertebrate abundances decreased by two orders of magnitude from Eldorado Creek to Eldorado Creek (m) and Slate Creek (m) (figure 10). Eldorado Creek (m) and Slate Creek (m) did not differ significantly in chlorophyll *a* or invertebrate abundance.

Stampede Creek is a complex example of possible heavy metal interactions (antagonistic or synergistic). Both selenium levels and macroinvertebrate abundances are significantly higher above the abandoned mine than below it. I found no evidence of elevated antimony downstream of the abandoned Stampede mine although West (1982) and West and Deschu (1984 as analyzed by Brown and Oswood, 1985) did. Other evidence also indicates that higher metal concentrations probably occur downstream of the mine periodically. Run-off from the abandoned tailings pond occasionally enters the

stream approximately 50 meters upstream of the Stampede (m) site. The pH of water in a puddle on these tailings measured 2.5 and all measured heavy metal levels (including selenium) were extremely high (see Appendix B 'Tail' sample).

Water chemistry is an important factor in ameliorating or exacerbating the impacts of heavy metals. Water temperature, pH, and hardness affect the amount of dissolved heavy metals in the water and their toxicity to the biota (Förstner and Wittman 1981). However, additive, synergistic and antagonistic interactions between metals are difficult to separate. Higher temperatures at Slate Creek (m) compared to Eldorado Creek (table 1), possibly the result of sparser riparian vegetation associated with mining, could increase toxicity. Because hardness may ameliorate heavy metal toxicity, the very hard waters at the mined and unmined Stampede Creek sites (compared to hard waters at all other sites) may reduce toxic effects. I cannot separate effects of possible increased levels of antimony and manganese below the Stampede Mine from possible effects of selenium above the mine. While antimony and manganese levels at Stampede were below the aquatic life water quality criteria (USEPA 1986), they were significantly higher than at the Jumbo Creek site where invertebrate and periphyton abundance were higher. Antagonistic effects of selenium (Eisler 1985) at Stampede Creek may be ameliorating the effects of other heavy metals.

Differences in heavy metal levels among the mining-affected sites may be due to the length of time since active mining. The mine on Stampede Creek was idle fourteen years when I sampled for invertebrates and heavy metals but the Slate Creek mine, (affecting Slate Creek (m) and Eldorado Creek (m)) had been inactive only one year. The Slate Creek mine was active the next year (1985) when I studied periphyton abundance at the Eldorado Creek (m) and Slate Creek (m) sites. Mining was also implemented differently at the Slate and Stampede creek mines. Overburden was

stripped to reach the Slate vein leaving exposed surface disturbances open to weathering and washing of heavy metals into the stream with run-off. On the other hand, a shaft gave access to the Stampede antimony veins causing comparatively little surface disturbance.

A regional pattern of antimony may occur in the Kantishna District. Recoverable antimony levels at all sites (mined and unmined) in the Eldorado/Slate Creek complex were significantly higher than at the Stampede Creek sites. It may be that antimony lies at shallower depths in the whole Eldorado/Slate Creek area. The significantly lower recoverable antimony levels at Jumbo Creek than all other sites correspond with its location outside the mineralized zone. Lower recoverable antimony and higher recoverable lead at Jumbo Creek compared to Eldorado Creek were the only significant heavy metal differences between the control sites. Eldorado Creek had similar levels of periphyton abundance but four times as many invertebrates as the Jumbo Creek control stream. This may have been due to the better habitat for invertebrates provided by the thick moss at Eldorado Creek

Several metals appear to be ubiquitous to the streams of the entire district although these data are based on small sample sizes. Any conclusions regarding exceedence of toxicity standards must be tentative pending more intensive sampling. Copper is present occasionally at or near concentrations associated with chronic effects on aquatic life at all sites except at the Stampede Creek sites, where water is sufficiently hard ( $\approx 300$  mg/L as  $\text{CaCO}_3$ ) to protect the biota. The zinc criterion for chronic toxicity was also occasionally exceeded by samples at all sites except at the Stampede Creek (m) site where it was nearly exceeded. Jumbo Creek and Eldorado Creek, the control streams, each had two samples that apparently exceeded the zinc criterion for aquatic life. The cadmium chronic criterion may also be exceeded by some samples at all of the



Slate /Eldorado Creek stations.

Copper is toxic to aquatic plants. Zinc is somewhat less toxic than copper, and other heavy metals such as cadmium and lead may be more or less toxic than zinc, depending upon chemical and physical conditions (Moore and Ramamoorthy 1984). Copper and zinc, and zinc and cadmium are known to interfere synergistically with aquatic plant growth (Moore and Ramamoorthy 1984). Some mosses (Bryophyta) are known to be tolerant to heavy metals, often concentrating them strongly from the surrounding water into their tissues. The "copper-mosses" which grow terrestrially on copper-rich rocks may dominate the flora when copper is present because of reduced competition from less tolerant plants (Whitton and Say 1975). While I have not identified the moss at Eldorado and Jumbo creeks, nor sampled its tissues for metals, it is likely tolerant of copper and zinc. Perhaps its abundance was less at Jumbo Creek than at Eldorado Creek because of the relatively greater concentration of lead in the water at Jumbo Creek, which clearly exceeded the criterion for chronic effects on aquatic life.

### **Benthic Organic Materials**

Course particulate organic material (CPOM) at both the mined and unmined Stampede Creek sites was an order of magnitude greater than in the other mined and unmined sites but the two Stampede sites were not statistically different. Even multiplying CPOM abundance at Eldorado Creek by three (to account for small CPOM particles lodged in the moss), both the Stampede Creek sites contain at least three times more CPOM than even the Eldorado Creek control site.

I expected the wider and denser riparian vegetation, and potential retention of large amounts of CPOM by moss and boulders to result in more CPOM at Eldorado Creek. The low standing crop of leaf litter in the unmined control streams, Eldorado



and Jumbo creeks compared to the selenium-affected Stampede Creek sites may be due to CPOM depletion by macroinvertebrates. Invertebrate shredders at the control sites are 1.5 - 8 times more abundant than at either of the Stampede Creek sites. The higher number of shredders could have simply consumed a much larger portion of the food resources at the control sites.

Furthermore, the quality of leaf litter at our study sites may have been influenced by heavy metal contamination. Leaf litter accumulates heavy metals in excess of the concentrations dissolved in the water column (Sheehan 1980). Heavy metals inhibit microorganisms that process detritus (Giesy 1978, Forbes & Magnuson 1980). Shredders prefer leaves partly decomposed or conditioned by fungi and bacteria to freshly fallen leaves (Cummins & Klug 1979). Even if numbers of microorganisms are not reduced, the heterotrophic activity of bacteria may be reduced by heavy metals (Milner and Goulder 1984) leaving the quality of detritus as a food source potentially higher at the unpolluted control sites. Heavy metal impacts at the detrital level of the aquatic ecosystem may radiate up the food chain. Reduced participation by shredders in the physical breakdown of CPOM into finer particles likely results in a reduced food supply for collectors (gatherers and filter-feeders). All this in turn results in lower quantity and quality of macroinvertebrate food for fish.

### **Periphyton**

Periphyton abundances at our unmined sites, measured by chlorophyll *a* levels on artificial substrates, are similar to those of unmined streams in interior Alaska (Table 4). Compared to other Alaskan mined sites (Van Nieuwenhuyse and LaPerriere 1986), periphyton abundance at our metal impacted sites was similar or somewhat higher, probably due to lower turbidities in Kantishna streams. I cannot attribute the low periphyton abundances at the Slate Creek (m) and Eldorado Creek (m) sites strictly to

**Table 4.** Chlorophyll a (mg/m<sup>2</sup>) values for artificial substrates in Alaskan streams selected from the literature and from this study. Second order streams unless noted.

|                             |             |   |
|-----------------------------|-------------|---|
| Bott et al. (1985 figure 3) |             |   |
| Pennsylvania                | 24.16       |   |
| Michigan                    | 37.82       |   |
| Idaho                       | 31.97       |   |
| Oregon                      | 98.59       |   |
| Anderson (1984 table 9)     |             |   |
| Alaska                      | 0.27        | (summer averages, 2nd<br>and 4 <sup>th</sup> order streams) |
| Oklahoma                    | 1.67        |   |
| B.C., Canada                | 33.97       |   |
| Van Nieuwenhuyse (1983)     |             |   |
| Alaska (unmined)            | 1.98 - 5.02 |   |
| Alaska (mined)              | 0.008-1.13  |   |
| This study                  |             |   |
| Eldorado Creek (um)         | 14.25       |   |
| Jumbo Creek (um)            | 17.98       |   |
| Stampede Creek (um)         | 4.54        |   |
| Stampede Creek (m)          | 5.70        |   |
| Eldorado Creek (m)          | 7.10        |   |
| Slate (m)                   | 2.04        |   |

heavy metals. Low abundance may be partially the result of scouring and turbidity (Van Nieuwenhuysse & LaPerriere 1986) as the Slate Creek mine was active during the periphyton study and released sediments into the water. However, I saw no visible periphyton growth during the previous inactive mining season even though sparser riparian vegetation probably allowed more light into the stream.

Transplanting colonized substrates from the unmined to the mined sites and vice versa (figure 9b and c) demonstrated that decreased periphyton abundance was a function of heavy metal toxicity (and possibly sediment scouring). Abundances on colonized substrates transplanted from Eldorado Creek to Slate Creek (m) declined to levels similar to abundances on the plates originally placed in Slate Creek.

Primary producers can take up heavy metals (Burton and Peterson 1979, Weatherly et al 1980, Förstner & Wittman 1981) making them available to the food chain, or they may remove dissolved metals from the water (Förstner & Wittman 1981) making the metals less available to much of the biota. Funk et al (1975) observed a reduction in tissue concentrations of metals as they passed to higher trophic levels.

Heavy metals can act alone or synergistically to inhibit growth, and reduce or inhibit photosynthesis (Weatherly 1980), leading to reduced secondary production in stream food webs. There is considerable evidence that algal taxa are differentially affected by heavy metals (Patrick 1978, Weatherly et al. 1980, Deniseger et al. 1986). A change in the taxonomic structure of the primary producers along with changes in abundance might affect the rest of the food chain based on them. If, for instance, diatoms are less abundant, there are fewer 'prey' items for invertebrates that feed on them (Patrick 1978).

## **Moss**

The effects of heavy metals on mosses in Kantishna streams is dramatic.

Mosses cover all boulder and cobble surfaces in the unmined control stream, Eldorado Creek, with a carpet 2-4 cm thick. However, a sharp demarcation between this luxuriant growth and a total absence of visible moss occurs at the point Slate Creek (m) waters enter Eldorado Creek. Moss transplanted from Eldorado Creek to Slate (m) Creek during the active mining season began to turn brown and die within three weeks. Since this was the active mining season, some of this may have been due to sediments deposited on the moss. Similarly, moss (*Fontinalis*) transplanted to a site below a mine in Wales containing lead, copper, zinc and manganese, started to die after eighteen weeks (McLean & Jones 1975). Mosses serve as habitat for epiphytic algae and invertebrates so that losses of moss via metal contamination may decrease diatom habitat (McLean & Jones 1975) and invertebrate abundance. Chironomidae are especially abundant in moss habitat (Mauer and Brusven 1983, Oswood et al. 1984) and are likely to be affected, if not by exposure to higher metal concentrations, certainly by the loss of habitat when moss is killed by heavy metals.

### **Macroinvertebrates**

Impacts on the benthic macroinvertebrate communities are the most commonly observed effects of mine effluents on aquatic organisms (Clarke 1974). Heavy metal contamination may potentially decrease abundance (numbers or biomass), decrease taxonomic richness (fewer taxa) or change the relative abundance (proportion) of one taxon compared to another. The one to two order of magnitude decrease in abundance with no obvious change in taxonomic richness (table 3) in the mined sites compared to the unmined sites supports the hypothesis that metal mine drainage is a stress causing decreased abundance without significant changes in taxa richness (Chadwick and Canton 1984). The unmined but selenium-contaminated site at Stampede Creek supported an order of magnitude more invertebrates than did the three mined sites.

However, it supported an order of magnitude fewer invertebrates than the Jumbo and Eldorado Creek sites. At Red Dog Creek in northwest Alaska, a mixture of metals (aluminum, cadmium, iron, lead and zinc) also depressed densities dramatically without a corresponding decrease in number of taxa (EVS 1983 ). Taxonomic richness (as opposed to abundance) may be relatively insensitive as a measure of mining impacts in Kantishna streams. Our study (table 3) contradicts several studies in which taxonomic richness was a better indicator of heavy metal contamination than was abundance (Sheehan & Winner 1984, Hughes 1984, Sheehan 1980). This may be a result of the already low taxonomic richness of Alaskan streams and rivers (Oswood, in review) and high elevation streams (Chadwick & Canton 1984 ) compared to low elevation streams and rivers in temperate regions.

Plecoptera, Chironomidae (Diptera), Ostracoda (Crustacea), and Hydracarina (Arachnida) demonstrated potential as heavy metal indicator taxa in the biogeographical and geological conditions of the Kantishna Hills. Comparisons of Eldorado Creek and Jumbo Creek with the other sites revealed some striking patterns. These unmined sites show low relative abundances of Capniidae (within Plecoptera), Nemoura, and Podmosta (within Nemouridae) and high relative abundances of Zapada (within Nemouridae). The presence of cervical gills, even in early instars, makes Zapada extremely easy to identify and therefore an attractive indicator organism. Nemoura (cinera) was among the dominants at high zinc levels (Armitage 1980) in an English stream. Absolute and relative abundance of Chironomidae were highest at the control sites (Eldorado and Jumbo Creeks), in sharp contrast to the strong positive association Winner et al. (1980) found between metal pollution and the relative abundance of Chironomidae. In Alaska, data from Red Dog Creek (Table 5, analyzed from EVS 1983) shows no clear difference in relative chironomid abundance between control and

metal impacted sites. Petersen (1986) found no clear relationship between metal pollution and relative abundance of Chironomidae in Sweden. He suggests that "It may well be that the percent chironomids, like other indices of community disturbance, works well within a particular stream system but is not readily transferable to other systems". Crustacea are considered intolerant of heavy metals (Weatherly et al 1980, discussed by Norris et al 1982). Relative abundance of Ostracoda was highest at our relatively uncontaminated study sites (figure 11). This decreased abundance of Ostracoda could be an indirect effect of heavy metals destroying moss habitat or direct toxic effects on the Ostracoda. Likewise, Hydracarina (water mites) were clearly at higher abundance at unmined sites (Figure 10). Wagener and LaPerriere (1985) also found that Hydracarina were rare or absent in Alaskan streams associated with placer mining.

Our data suggest that heavy metals impact overall abundances rather than affecting trophic organization. There were few differences in proportions of functional groups among our sites. I hypothesized decreased relative abundance of scrapers (grazers) at sites impacted by heavy metals because of decreased abundance of their periphyton food base. However, scrapers were at low abundance at all sites with no striking differences between sites. The higher relative abundance of shredders at both the mined and unmined Stampede Creek sites compared to other sites was striking. Shredders comprise nearly one-half the total macroinvertebrates at the Stampede Creek sites but less than 1/6 th at the control sites (Jumbo and Eldorado creeks) and the other mine sites (Eldorado (m) and Slate (m) creeks). This correlated with the unexpected

**Table 5.** Density and relative abundance of major taxa of benthic macroinvertebrates in Red Dog Creek (based upon data from EVS 1983).

| Station #'s   | Density |       |          |      |
|---------------|---------|-------|----------|------|
|               | control |       | degraded |      |
|               | 180     | 620   | 110      | 520  |
| Chironomidae  | 10920   | 10774 | 964      | 1024 |
| Plecoptera    | 8031    | 1305  | 65       | 62   |
| Ephemeroptera | 3161    | 1130  | 431      | 266  |
| Oligochaeta   | 4126    | 1825  | 151      | 47   |

#### Relative Abundance

|               |    |    |    |    |
|---------------|----|----|----|----|
| Chironomidae  | 42 | 60 | 33 | 63 |
| Plecoptera    | 31 | 12 | 7  | 6  |
| Ephemeroptera | 12 | 10 | 45 | 26 |
| Oligochaeta   | 16 | 18 | 16 | 5  |

occurrence of significantly more CPOM at the Stampede Creek sites than at the other sites (figure 9). Since the Stampede Creek sites had so much more CPOM than all the other sites, it's difficult to attribute the high relative abundance of shredders to heavy metals in general or selenium specifically. The small proportion of collectors at the Stampede Creek sites may be a function of the high relative shredder abundance. Heavy metals probably do not strongly affect the functional community structure of our streams.

Studies evaluating changes in trophic community structure (functional groups) in heavy metal contaminated streams are contradictory, compounded by differences among studies in assigning taxa to functional groups. Specht et al. (1984) saw essentially no changes from coal fly ash effluents which contained high levels of arsenic and selenium (along with higher pH and particulates). Sheehan (1980) found that predators decreased in relative abundance with increasing copper. At Red Dog Creek, Alaska, high levels of zinc, cadmium, lead and iron impacted scrapers (Table 6, data analyzed from EVS 1983). Though not evaluated for statistical significance, shredders decreased and scrapers increased in relative abundance within the degraded zone. Regional differences in responses of stream biotas to metal pollution are probably the consequence of two factors: most point sources produce complex mixtures of metals (these mixtures vary from study to study) and the taxonomic composition of streams differs from region to region.

The responses of some of the taxa in our study correspond to trends in other areas of the world although others seem unique to Alaska. It is clear that the dominant taxa in Alaska differ from lower latitudes (Hobbie 1973, Oswood, in review). In fact, latitudinal differences are evident even within the state of Alaska (Oswood, in review) There is evidence that stream classification systems developed in temperate regions do



**Table 6.** Density and relative abundance of functional groups<sup>1</sup> of benthic macroinvertebrates in Red Dog Creek (based upon data from EVS 1983).

| Station #'s                      | Density        |      |                 |     |
|----------------------------------|----------------|------|-----------------|-----|
|                                  | control<br>180 | 620  | degraded<br>110 | 520 |
| Predators <sup>2</sup>           | 1221           | 90   | 44              | 73  |
| Detritivores <sup>3</sup>        | 4643           | 2136 | 169             | 72  |
| Collector/Gatherers <sup>4</sup> | 11059          | 6540 | 368             | 683 |
| Collector/Filterers <sup>5</sup> | 1360           | 417  | 65              | 62  |
| Shredders <sup>6</sup>           | 8099           | 1352 | 69              | 62  |
| Scrapers <sup>7</sup>            | 3161           | 1130 | 431             | 267 |

| Station #'s         | Relative Abundance |     |                 |     |
|---------------------|--------------------|-----|-----------------|-----|
|                     | control<br>180     | 620 | degraded<br>110 | 520 |
| Predators           | 4                  | 1   | 4               | 6   |
| Detritivores        | 16                 | 18  | 15              | 6   |
| Collector/Gatherers | 37                 | 56  | 32              | 56  |
| Collector/Filterers | 5                  | 4   | 6               | 5   |
| Shredders           | 27                 | 12  | 6               | 5   |
| Scrapers            | 11                 | 9   | 38              | 22  |

<sup>1</sup> Functional group designations based upon Wetzel (1976) and Merritt and Cummins (1978).

<sup>2</sup> Platyhelminthes, Coleoptera, Ceratopogonidae, Empididae, Tardigrada, Hydracarina

<sup>3</sup> Nematoda, Annelida

<sup>4</sup> Collembola, Trichoptera, Chironomidae

<sup>5</sup> Ostracoda, Simuliidae

<sup>6</sup> Plecoptera, Tipulidae

<sup>7</sup> Ephemeroptera

not work in Alaska (Oswood & Barber 1982). Even Eldorado Creek, with extremely high macroinvertebrate abundance (see comparison table in Cowan & Oswood 1984) is considered moderately stressed (Magnum 1986) using the Biotic Condition Index (Winget & Magnum 1979). If a biotic index of metal impacts is used in Alaska, it must be one developed for Alaska. Even Alaskan biotic indexes may require calibration for different areas of the state. Heavy metal baseline data already collected makes Denali Park a likely place to start.

## **Fish**

Fish studies by the National Park Service (Meyer & Kavanagh 1983) indicate that the fish are less abundant and smaller in the mined streams than in unmined streams in Kantishna. I saw Arctic grayling in both of the control streams, Eldorado Creek and Jumbo Creek. Several fish were seen just below the confluence of Slate Creek and Eldorado Creek but they quickly retreated back up into the unmined portion of Eldorado Creek. I did not see fish in any of the metal impacted sites, including Stampede Creek above the mine. Low fish populations are probably due to direct (toxicological) and indirect impacts. Fish are known to actively avoid metal polluted streams (Hara et al. 1983). The already noted impacts to the detrital and periphytic food webs must certainly affect fish abundance as well.

In summary, mining activity may impact all levels of the stream ecosystem. This study provides evidence that decreased algal abundance, moss abundance and invertebrate abundance are all clearly associated with mining activity at the Slate/Eldorado Creek sites. However, Stampede Creek demonstrates that mineralized but unmined stream reaches may be impacted by heavy metals and is a complex example of heavy metal contamination. No significant increases in heavy metals were detected below the abandoned antimony mine although earlier data indicated increases in

antimony and manganese. Selenium was unexpectedly higher above the mine. These confounding metal inputs presumably account for the general lack of substantial differences in macroinvertebrates and periphyton upstream and downstream of the mine. However, macroinvertebrate and chlorophyll *a* abundances were lower at both sites on Stampede Creek than at the unmineralized, unmined control stream, Jumbo Creek.

## Conclusions

Recent mining was associated with increased recoverable antimony, arsenic and manganese at the Eldorado and Slate Creek sites compared to the unmined sites on Eldorado and Jumbo Creeks.

Increased selenium from natural sources upstream of an abandoned antimony lode mine on Stampede Creek apparently balanced downstream effects of antimony and manganese. While there were no substantial biotic differences upstream and downstream of the mine, both sites showed decreased abundance of periphyton and macroinvertebrates when compared to Jumbo Creek (a control stream with no history of mining, located in an unmineralized region).

Heavy metals (and possible sedimentation) during active mining were associated with decreased periphyton abundance at metal impacted sites on Eldorado and Slate Creeks compared to unmined control sites on Jumbo and Eldorado Creeks.

Reciprocal transfers of colonized artificial substrates between mined (Slate Creek) and unmined (Eldorado Creek) showed rapid loss of periphyton from substrates transferred from Slate Creek To Eldorado Creek while plates from Slate Creek (nearly devoid of periphyton) were rapidly colonized when transferred to Eldorado Creek. Moss transplanted from the unmined Eldorado Creek to the mined Slate Creek site began to die within three weeks.

Abundances of macroinvertebrates decreased as much as two orders of magnitude at the mined sites on Eldorado, Slate, and Stampede creeks compared to the unmined sites on

Eldorado, Jumbo, and Stampede creeks. Macroinvertebrate abundances were slightly decreased at Stampede Creek (m) compared to the upstream unmined but selenium-affected Stampede site.

The number of invertebrate taxa at antimony mine sites does not appear to differ substantially from unmined sites. However, the taxonomic community structure (relative abundances of particular taxa) differs between mined and unmined streams.

Crustacea, Chironomidae (Diptera), Hydracarina (Arachnida), Nemouridae (Plecoptera), and Zapada (Nemouridae) decreased in relative abundance with metal pollution while Capniidae (Plecoptera), Nemoura (Nemouridae), and Podmosta (Nemouridae) increased in relative abundance at mine sites.

The Nemouridae (Plecoptera) have a strong potential as an Alaskan heavy metal indicator. The genus Zapada is especially attractive because it seems to decrease in relative abundance over a gradient of heavy metal pollution and is easily identified.

Taxa indicative of metal pollution in temperate areas need corroboration before they are used as indicator taxa in Alaska.

Mining did not consistently affect functional group composition of macroinvertebrates.

Depletion of detrital resources by more abundant shredder insects probably explained the significantly lower standing crop of CPOM at the unmined control sites on Jumbo and Eldorado creeks compared to the heavy metal affected sites on Stampede Creek

above and below the mine.

Higher water temperatures may increase heavy metal toxicity in Slate Creek while the very hard waters in the Stampede Creek sites may decrease heavy metal toxicities.

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## APPENDIX A. HEAVY METAL QUALITY CONTROL

Quality control in heavy metal determinations was approached in three ways. Heavy metal standards (U.S. Environmental Protection Agency quality assurance reference samples) were run by Northern Testing Laboratories at the same time that our samples were run. Concentrations of all metals were within specified acceptable limits. Secondly, control samples prepared from 1.5 ml of nitric acid (used as sample preservative) in double distilled water were analyzed with the stream samples. These were intended as controls for possible sample contamination from the sample bottles or acid preservative. Control preparations were made from both reagent grade nitric acid (n=1) used on the first sampling trip and Ultrex<sup>TM</sup> nitric acid (n=3) used on remaining trips. Unfortunately, these preparations were not made until well after the end of the sampling season and were apparently contaminated (for some but not all) metals by the rubber bulb of the dropper bottle used to store the acid. The analysis reported by the manufacturer of Ultrex<sup>TM</sup> indicates that contamination of samples from Ultrex acid is most unlikely. Samples from Jumbo Cr. serve as an additional (third) check on possible contamination since Jumbo Cr. is in a relatively unmineralized region and not disturbed by mining activities. Any contamination from sample bottles or acid preservative should show up in analyses from Jumbo Cr. as an addition to actual stream water concentrations of metals. We used the combination of the control preparations and results from Jumbo Cr. to examine possible sample contamination. We consider contamination by a given metal to be absent if the concentrations reported for Jumbo Cr. samples or for the control preparations is at or below the detection limit for that metal. Table A-1 summarizes these results. Prolonged storage (past the end of the field season) in a dropper bottle produced contamination of the acid by some metals (notably arsenic, cadmium, and manganese) but these metals were below detection limits in water samples from Jumbo Cr. so that the acid used as a preservative during the field season could not have been contaminated.



Appendix A-1 EXAMINATION OF POSSIBLE CONTAMINATION FROM SAMPLING PROCEDURES.

Control preparations consist of 1.5 ml of acid preservative in 1 l double-distilled water. Metals below detection limits in either control preparations or Jumbo Cr. samples (unmined stream in relatively unmineralized region) indicates no contamination. C = CONTAMINATED (concentration of control preparation above average stream water concentration) and BDL = BELOW DETECTION LIMITS.

| METAL     | CONTROL PREPARATIONS  |                  | JUMBO CR. SAMPLES |
|-----------|---|------------------|-------------------|
|           | REAGENT GRADE   | ULTREX           |                   |
| ARSENIC   | C   | C                | BDL               |
| ANTIMONY  | BDL   | BDL              | ---               |
| CADMIUM   | C   | C                | BDL               |
| CHROMIUM  | BDL   | C                | BDL               |
| COPPER    | BDL   | BDL              | ---               |
| IRON      | BDL   | BDL <sup>1</sup> | ---               |
| LEAD      | near detection limit, much lower than average stream concentrations |                  | ---               |
| MANGANESE | C   | C                | BDL               |
| NICKEL    | BDL   | C <sup>2</sup>   | BDL <sup>3</sup>  |
| SELENIUM  | BDL   | C                | BDL               |
| ZINC      | much lower than average stream concentrations                       |                  | ---               |

<sup>1</sup> One sample showed a measurable trace of iron.

<sup>2</sup> One sample at detection limits, two samples with measurable concentrations.

<sup>3</sup> One sample (of six) with measurable concentration.

Appendix B Recoverable heavy metals, mg/l, in water samples taken at sample sites in Kantishna Hills area of Denali National Park. BDL=below detection limit, (m)=mined. eld=Eldorado Creek, slt=Slate Creek, stp=Stampede Creek, jmb=Jumbo Creek tail=Stampede Creek tailings pond, epa=heavy metal 'quality assurance samples', r-nitrc=reagent grade nitric acid in double distilled water.

| date | site   | As     | Sb     | Cd    | Cr    | Cu    | Fe    | Pb     | Mn    | Ni    | Se     | Zn    |
|------|--------|--------|--------|-------|-------|-------|-------|--------|-------|-------|--------|-------|
| 0616 | eld    | BDL    | 0.390  | BDL   | BDL   | 0.004 | 0.007 | BDL    | 0.006 | 0.013 | BDL    | 0.018 |
| 0630 | eld    | BDL    | 0.0502 | BDL   | BDL   | 0.003 | 0.007 | BDL    | BDL   | 0.010 | BDL    | 0.012 |
| 0723 | eld    | BDL    | 0.0637 | 0.002 | BDL   | 0.007 | 0.014 | 0.0010 | BDL   | 0.012 | BDL    | 0.015 |
| 0813 | eld    | BDL    | 0.0544 | BDL   | 0.009 | 0.012 | 0.012 | 0.0019 | BDL   | BDL   | BDL    | 0.117 |
| 0902 | eld    | BDL    | 0.0720 | BDL   | BDL   | 0.003 | BDL   | 0.0013 | BDL   | BDL   | BDL    | 0.014 |
| 0916 | eld    | BDL    | 0.0745 | 0.002 | BDL   | 0.019 | 0.158 | 0.0024 | BDL   | 0.020 | BDL    | 0.058 |
| 0616 | eld(m) | 0.0017 | 0.180  | BDL   | BDL   | 0.003 | 0.141 | BDL    | 0.045 | 0.015 | BDL    | 0.002 |
| 0630 | eld(m) | BDL    | 0.239  | 0.004 | BDL   | 0.007 | 0.128 | 0.0013 | 0.034 | 0.010 | BDL    | 0.003 |
| 0723 | eld(m) | 0.0031 | 0.151  | BDL   | BDL   | 0.012 | 0.195 | 0.0022 | 0.048 | BDL   | BDL    | 0.084 |
| 0813 | eld(m) | 0.0064 | 0.146  | BDL   | 0.003 | 0.004 | 0.161 | 0.0013 | 0.066 | BDL   | BDL    | 0.004 |
| 0902 | eld(m) | 0.0053 | 0.106  | 0.003 | BDL   | 0.006 | 0.251 | BDL    | 0.078 | 0.010 | BDL    | 0.034 |
| 0916 | eld(m) | BDL    | 0.109  | BDL   | BDL   | 0.006 | 0.194 | 0.0023 | 0.064 | 0.016 | BDL    | 0.036 |
| 0616 | slt(m) | 0.0034 | 0.385  | BDL   | 0.004 | 0.011 | 0.197 | 0.0024 | 0.087 | BDL   | BDL    | 0.066 |
| 0630 | slt(m) | 0.0035 | 0.508  | BDL   | BDL   | 0.004 | 0.150 | 0.0015 | 0.058 | 0.029 | BDL    | 0.027 |
| 0723 | slt(m) | 0.0143 | 0.401  | BDL   | BDL   | 0.161 | 0.228 | 0.0088 | 0.089 | 0.025 | BDL    | 0.056 |
| 0813 | slt(m) | 0.0037 | 0.307  | BDL   | BDL   | 0.006 | 0.159 | BDL    | 0.098 | 0.016 | BDL    | 0.026 |
| 0902 | slt(m) | BDL    | 0.183  | 0.003 | 0.004 | 0.008 | 0.419 | 0.0018 | 0.119 | 0.020 | BDL    | 0.020 |
| 0916 | slt(m) | BDL    | 0.242  | BDL   | BDL   | 0.003 | 0.176 | 0.0016 | 0.114 | 0.019 | BDL    | 0.027 |
| 0617 | stp    |        |        |       |       |       |       |        |       |       |        |       |
| 0701 | stp    | BDL    | 0.0141 | BDL   | 0.005 | 0.007 | 0.201 | 0.0066 | 0.014 | BDL   | 0.0014 | 0.057 |
| 0722 | stp    | BDL    | 0.0157 | BDL   | BDL   | 0.006 | 0.344 | 0.0033 | 0.009 | 0.013 | BDL    | 0.008 |
| 0811 | stp    | BDL    | 0.0191 | BDL   | 0.003 | 0.062 | 0.069 | 0.0054 | BDL   | 0.017 | BDL    | 0.014 |
| 0901 | stp    | BDL    | 0.0275 | BDL   | 0.007 | 0.014 | 0.113 | 0.0057 | 0.007 | 0.017 | 0.0027 | 0.005 |
| 0915 | stp    | BDL    | 0.0142 | BDL   | 0.006 | 0.009 | 0.052 | 0.0073 | 0.003 | BDL   | 0.0029 | 0.034 |
| 0617 | stp(m) | BDL    | 0.0230 | BDL   | BDL   | 0.013 | 0.252 | 0.0048 | 0.036 | 0.019 | BDL    | 0.034 |
| 0701 | stp(m) | BDL    | 0.0163 | BDL   | BDL   | 0.004 | 0.264 | 0.0042 | 0.010 | 0.020 | BDL    | 0.002 |
| 0722 | Stp(m) | BDL    | 0.0114 | BDL   | BDL   | 0.005 | 0.308 | 0.0020 | 0.012 | 0.015 | BDL    | 0.002 |
| 0811 | Stp(m) | BDL    | 0.0208 | BDL   | 0.007 | 0.005 | 0.197 | 0.0020 | 0.006 | 0.014 | BDL    | 0.004 |
| 0901 | Stp(m) | BDL    | 0.0140 | BDL   | 0.005 | 0.010 | 0.340 | 0.0050 | 0.011 | 0.019 | 0.0012 | 0.006 |
| 0915 | Stp(m) | BDL    | 0.0276 | BDL   | 0.011 | 0.003 | 0.069 | 0.0078 | BDL   | 0.014 | BDL    | 0.009 |
| 0618 | jmb    | BDL    | 0.0086 | BDL   | BDL   | 0.007 | 0.052 | 0.0026 | BDL   | BDL   | BD     | 0.016 |
| 0702 | jmb    | BDL    | 0.0084 | BDL   | BDL   | 0.004 | 0.060 | 0.0022 | BDL   | 0.017 | BDL    | 0.046 |
| 0721 | jmb    | BDL    | 0.0096 | BDL   | BDL   | 0.004 | 0.039 | 0.0030 | BDL   | BDL   | BDL    | 0.006 |

Appendix B (continued)

| date | site    | As     | Sb     | Cd     | Cr    | Cu    |
|------|---------|--------|--------|--------|-------|-------|
| 0813 | jmb     | BDL    | 0.0115 | BDL    | BDL   | 0.009 |
| 0903 | jmb     | BDL    | 0.0068 | BDL    | BDL   | 0.010 |
| 0917 | jmb     | BDL    | 0.0081 | BDL    | BDL   | 0.011 |
| 0701 | tail    | 0.239  | 0.603  | 0.034  | 0.084 | 0.217 |
| 1015 | epa11   | 0.0329 | BDL    | 0.0137 | 0.020 | 0.010 |
| 1015 | epa12   | 0.0394 | BDL    | 0.0135 | 0.016 | 0.004 |
| 1015 | epa13   | 0.0365 | BDL    | 0.0108 | 0.003 | 0.014 |
| 1015 | epa21   | 0.227  | 0.0017 | 0.0436 | 0.258 | 0.355 |
| 1015 | epa23   | 0.208  | 0.0019 | 0.0394 | 0.306 | 0.337 |
| 1015 | epa31   | 0.0079 | BDL    | 0.0032 | 0.018 | BDL   |
| 1015 | epa32   | 0.0104 | BDL    | 0.0045 | BDL   | 0.002 |
| 1015 | epa33   | 0.0034 | BDL    | 0.0037 | 0.016 | BDL   |
| 1008 | r-nitrc | 0.0122 | BDL    | 0.0033 | BDL   | BDL   |

|       | Fe     | Pb     | Mn    | Ni      | Se    | Zn    |
|-------|--------|--------|-------|---------|-------|-------|
|       | 0.153  | 0.0017 | BD    | BDL     | BD    | 0.028 |
|       | BDL    | 0.0033 | BDL   | BDL     | BDL   | 0.027 |
|       | 0.389  | 0.0046 | BDL   | BDL     | BDL   | 0.042 |
| 174.0 | 0.0492 | 13.3   | 2.09  | 0.0473  | 3.24  |       |
| 0.042 | 0.0427 | 0.019  | 0.025 | 0.0108  | 0.016 |       |
| 0.008 | 0.0501 | 0.029  | 0.025 | 0.0106  | 0.018 |       |
| 0.021 | 0.0461 | 0.015  | 0.024 | 0.0064  | 0.014 |       |
| 0.752 | 0.391  | 0.389  | 0.222 | 0.0478  | 0.434 |       |
| 0.696 | 0.377  | 0.338  | 0.213 | 0.0470  | 0.411 |       |
| BDL   | 0.0006 | 0.011  | 0.007 | 0.00241 | 0.004 |       |
| BDL   | 0.0008 | 0.006  | 0.013 | 0.0022  | 0.007 |       |
| 0.013 | 0.0003 | 0.015  | BDL   | BDL     | 0.005 |       |
| BDL   | 0.0004 | 0.009  | BDL   | BDL     | 0.007 |       |

Appendix C. Functional group designations. CG = collector-gatherer, Pr = predator, Ge = generalist, SC = scraper, FF = filter feeder, SH = shredder, CO/SC = collector-scraper. Sources as follows: 1. Merritt and Cummins 1984; 2. Brown 1987; 3. Cowan et al. 1983; 4. Oswood et al. 1984; 5. Hawkins and Sedell 1981; 6. Irons 1985; 7. Pennak 1978; 8. This study

| Taxon                   | Functional Group Designation<br>(numbers indicate sources<br>for designation) |
|-------------------------|---|
| Collembola              | CO/G 1  |
| Diptera Ceratopogonidae | PR 1,5  |
| Chironomidae            |   |
| Dolichopodidae          | PR 1  |
| Empididae (all genera)  | PR 1, 2, 4, 5   |
| Simuliidae              |   |
| Gymnopsis               | SC 1  |
| Simuliidae              |   |
| all other genera        | FF 1  |
| Stratiomyidae           | CG 1  |
| Tabanidae               | PR 1  |
| Tipulidae               |   |
| Dicranota               | PR 1,2,3,4  |
| Gonomyodes              | PR ?  |
| Hexatoma                | PR 5  |
| Molophilus              | PR 1  |
| Pedicia                 | PR 1,5  |
| Tipula                  | GE 1,2,3,   |
| Ephemeroptera           |   |
| Baetidae                | CO/SC 1,4,5,8   |
| Ephemerellidae          |   |
| Drunella                | GE 1,2,3  |
| Heptageniidae           |   |
| Cinygmula               | CO/SC 1,2,4,5,8   |
| Epeorus                 | CO/SC 1,2,5   |
| Rithrogena              | CO/SC 1   |
| Siphonuridae            |   |
| Ameletus                | CO 1,2,4,5,8  |
| Plecoptera              |   |
| Capniidae               |   |
| Capnia                  | SH 1,2,3,4,5  |
| Chloroperlidae          |   |
| Alloperla               | PR 1,2,3,4,5  |
| Neaviperla              | PR 1,5  |
| Paraperla               | PR 1,5  |
| Plumiperla              | PR 1,5  |
| Leuctridae              |   |
| Perlomyia               | SH 1  |
| Nemouridae              |   |
| Nemoura                 | SH 1,2,8  |
| Podmosta                | SH 2,4,5,8  |
| Zapada                  | H 1,2,3,4,5   |
| Perlodidae              |   |
| Arcynopteryx            | PR 1,5  |
| Isoperla                | PR 1,2,3,4,5  |
| Taeniopterygidae        |   |
| Taenionema              | CO/SC 1,2   |
| Trichoptera             |   |
| Limnephilidae           |   |
| Apatania                | SC 1,5,6  |
| Ecclisomyia             | GE 1,3,4,5  |
| Rhyacophilidae          |   |
| Rhyacophila             | PR 1,3,5  |
| Crustacea               |   |
| Copepoda                | CO 7  |
| Ostracoda               | CO 7  |
| Arachnida               |   |
| Hydracarina             | PR 5,7  |
| Nematoda                | G 7   |
| Platyhelminthes         | P 7   |

Appendix D. Average Chlorophyll *a*, pheophytin and ashfree dry weight in mg/l by date and site for periphyton at study sites in Kantishna Hills of Denali National Park. Eld = Eldorado Cr. Stp = Stampede Cr. Slate = Slate Cr.(m) = mined S->E = Slate Cr.(m) to Eldorado Cr. S->Sd = Stampede Cr. to Stampede(m) Cr.

| Site      | Date      | Chlorophyll <i>a</i> | Pheophytin | Ash-Free<br>Dry Weight |
|-----------|-----------|----------------------|------------|------------------------|
| Eld       | 9-11 July | 17.9405              | -0.04647   | 256784                 |
| Eld       | 24-5 July | 27.9230              | 0.15322    | 422453                 |
| Eld       | 15 Aug    | 7.8852               | 0.06080    | 470420                 |
| Eld       | 4-6 Sept  | 5.2705               | 0.01295    | 100409                 |
| Eld       | 17-9 Sept | 11.5213              | 0.08841    | 197827                 |
| Eld(m)    | 9-11 July | 0.7920               | 0.00182    | 103481                 |
| Eld(m)    | 24-5 July | 1.4195               | 0.00595    | 24545                  |
| Eld(m)    | 4-6 Sept  | 13.2953              | 0.02049    | 3120714                |
| Slate(m)  | 9-11 July | 0.0424               | -0.00229   | 77895                  |
| Slate(m)  | 24-5 July | 0.1939               | 0.02186    | 23384                  |
| Slate(m)  | 15 Aug    | 8.1747               | 0.02748    | 154286                 |
| Slate(m)  | 4-6 Sept  | 2.6860               | 0.00687    | 91831                  |
| Slate(m)  | 17-9 Sept | 0.3639               | 0.00334    | 421598                 |
| Stp       | 9-11 July | 6.1106               | 0.00912    | 201835                 |
| Stp       | 24-5 July | 5.8802               | 0.19112    | 130541                 |
| Stp       | 4-6 Sept  | 7.9044               | -0.00172   | 347459                 |
| Stp       | 17-9 Sept | 1.7506               | 0.00683    | 156001                 |
| Stp(m)    | 9-11 July | 1.8666               | 0.00709    | 245030                 |
| Stp(m)    | 24-5 July | 6.4527               | 0.03313    | 476178                 |
| Stp(m)    | 4-6 Sept  | 14.7752              | 0.05715    | 617948                 |
| Stp(m)    | 17-9 Sept | 3.0387               | 0.00971    | 245238                 |
| Jumbo     | 24-5 July | 4.6587               | 0.03238    | 176981                 |
| Jumbo     | 4-6 Sept  | 7.0162               | 0.01534    | 256516                 |
| Jumbo     | 17-9 Sept | 26.0688              | -0.17605   | 226772                 |
| S(m) ->E  | 15 Aug    | 1.8510               | 0.01735    | 31316                  |
| S(m) ->E  | 4-6 Sept  | 9.8859               | -0.06864   | 385474                 |
| S(m) ->E  | 17-9 Sept | 27.1509              | 0.01135    | 460882                 |
| E->S(m)   | 15 Aug    | 55.8719              | -0.25955   | 3767836                |
| E->S(m)   | 4-6 Sept  | 4.7658               | 0.05943    | 250128                 |
| E->S(m)   | 17-9 Sept | 2.2991               | -0.05566   | 143394                 |
| Sd(m) ->S | 4-6 Sept  | 10.7816              | -0.00132   | 221263                 |
| Sd(m) ->S | 17-9 Sept | 1.1567               | 0.01033    | 137181                 |
| S->Sd(m)  | 4-6 Sept  | 16.2888              | 0.02015    | 254029                 |
| S->Sd(m)  | 17-9 Sept | 3.2039               | 0.01507    | 270064                 |

## Appendix E. Macroinvertebrate densities by taxon in benthic samples.

| 1  | STREAM            | DATE      | SAMPLE LOC. | MOSS           | CPOM           | Collembola | Diptera         | Diptera      | Diptera      |
|----|-------------------|-----------|-------------|----------------|----------------|------------|-----------------|--------------|--------------|
| 2  |                   |           |             | mg AFDW/0.1 M2 | mg AFDW/0.1 M2 | Collembola | Ceratopogonidae | Chironomidae | Chironomidae |
| 3  |                   |           |             |                |                |            | unidentified    | larvae       | pupae        |
| 4  |                   |           |             |                |                |            |                 |              |              |
| 5  | Eldorado Cr. (UM) | 16 Jun 84 | 26-04       |                | 68.65          |            | 2               | 4468         |              |
| 6  | Eldorado Cr. (UM) | 16 Jun 84 | 02-02       | 1188.8         | 315.95         |            | 9               | 1367         |              |
| 7  | Eldorado Cr. (UM) | 16 Jun 84 | 06-04       | 1552.9         | 130.05         |            |                 | 1318         |              |
| 8  | Eldorado Cr. (UM) | 16 Jun 84 | 04-05       | 1751           | 3.9            |            | 8               | 1066         | 1            |
| 9  | Eldorado Cr. (UM) | 30 Jun 84 | 13-04       | 646.55         | 6.1            |            |                 | 3648         |              |
| 10 | Eldorado Cr. (UM) | 30 Jun 84 | 08-04       | 1.95           | 35.35          |            | 5               | 990          |              |
| 11 | Eldorado Cr. (UM) | 30 Jun 84 | 01-00       | 5461           | 28.95          |            | 4               | 6414         | 267          |
| 12 | Eldorado Cr. (UM) | 30 Jun 84 | 20-03       | 6690           | 21.1           |            | 1               | 1725         | 18           |
| 13 | Eldorado Cr. (UM) | 23 Jul 84 | 30-09       | 2994           | 201.8          |            | 3               | 1822         | 39           |
| 14 | Eldorado Cr. (UM) | 23 Jul 84 | 24-02       | 1429.2         | 6.8            |            | 3               | 3610         |              |
| 15 | Eldorado Cr. (UM) | 23 Jul 84 | 05-04       | 10114          | 157.35         |            | 12              | 6940         | 144          |
| 16 | Eldorado Cr. (UM) | 23 Jul 84 | 18-04       | 3313           | 45.8           |            | 5               | 2835         |              |
| 17 | Eldorado Cr. (UM) | 12 Aug 84 | 12-01       | 5377           | 97.45          |            | 13              | 4801         | 89           |
| 18 | Eldorado Cr. (UM) | 12 Aug 84 | 14-03       | 15314          | 9.35           |            | 5               | 9411         | 88           |
| 19 | Eldorado Cr. (UM) | 12 Aug 84 | 26-02       | 9437           | 63.9           |            | 8               | 4342         | 76           |
| 20 | Eldorado Cr. (UM) | 12 Aug 84 | 08-03       | 186.8          | 110.85         |            | 2               | 237          |              |
| 21 | Eldorado Cr. (UM) | 2 Sep 84  | 03-02       | 4615           | 201.6          |            | 13              | 864          |              |
| 22 | Eldorado Cr. (UM) | 2 Sep 84  | 29-03       | 9455           | 251.65         |            | 6               | 4642         |              |
| 23 | Eldorado Cr. (UM) | 2 Sep 84  | 21-01       | 7997           | 787.4          |            | 14              | 3724         | 15           |
| 24 | Eldorado Cr. (UM) | 2 Sep 84  | 08-02       | 3510           | 618.95         |            | 6               | 621          | 2            |
| 25 | Eldorado Cr. (UM) | 16 Sep 84 | 19-07       | 9944           |                |            | 2               | 119          | 2            |
| 26 | Eldorado Cr. (UM) | 16 Sep 84 | 11-09       | 22222          | 605.3          |            | 4               | 2143         | 6            |
| 27 | Eldorado Cr. (UM) | 16 Sep 84 | 06-02       | 884.1          | 4.6            |            | 8               | 192          |              |
| 28 | Eldorado Cr. (UM) | 16 Sep 84 | 02-02       | 3435           | 63             |            | 31              | 1245         | 1            |
| 29 | Eldorado Cr. (M)  | 16 Jun 84 | 06-04       | 220.8          | 209.55         |            | 4               | 33           |              |
| 30 | Eldorado Cr. (M)  | 16 Jun 84 | 12-04       | 0.15           | 83.5           |            | 1               | 6            |              |
| 31 | Eldorado Cr. (M)  | 16 Jun 84 | 15-01       | 54.8           | 66.3           |            |                 | 2            |              |
| 32 | Eldorado Cr. (M)  | 16 Jun 84 | 23-01       | 1.9            | 28.05          |            | 3               | 4            |              |
| 33 | Eldorado Cr. (M)  | 30 Jun 84 | 23-03       | 127.6          | 35.45          |            |                 | 38           |              |
| 34 | Eldorado Cr. (M)  | 30 Jun 84 | 00-02       | 384.6          | 799.3          |            |                 | 15           |              |
| 35 | Eldorado Cr. (M)  | 30 Jun 84 | 18-02       | 17.4           | 37.2           |            |                 | 11           |              |
| 36 | Eldorado Cr. (M)  | 30 Jun 84 | 05-04       | 3.45           | 11.15          |            | 2               | 9            |              |
| 37 | Eldorado Cr. (M)  | 23 Jul 84 | 01-02       | 273.2          | 494.35         |            | 1               | 84           | 8            |
| 38 | Eldorado Cr. (M)  | 23 Jul 84 | 02-04       | 120.05         | 204.95         |            | 2               | 120          |              |
| 39 | Eldorado Cr. (M)  | 23 Jul 84 | 27-01       | 169.15         | 214.1          |            |                 | 43           | 2            |
| 40 | Eldorado Cr. (M)  | 23 Jul 84 | 01-04       | 8.9            | 29.9           |            | 2               | 33           | 3            |
| 41 | Eldorado Cr. (M)  | 12 Aug 84 | 07-04       | 2.1            | 6.45           |            | 7               | 15           | 1            |
| 42 | Eldorado Cr. (M)  | 12 Aug 84 | 13-01       | 0.9            | 119.3          |            | 2               | 27           | 1            |
| 43 | Eldorado Cr. (M)  | 12 Aug 84 | 26-03       | 60.9           | 97.65          |            |                 | 24           | 4            |
| 44 | Eldorado Cr. (M)  | 12 Aug 84 | 10-01       | 8.6            | 10.5           |            | 3               | 30           | 2            |
| 45 | Eldorado Cr. (M)  | 2 Sep 84  | 02-02       | 31.7           | 89.7           |            | 2               | 28           |              |
| 46 | Eldorado Cr. (M)  | 2 Sep 84  | 08-03       |                | 43.8           |            | 4               | 7            |              |
| 47 | Eldorado Cr. (M)  | 2 Sep 84  | 01-05       | 46.75          | 38.45          |            |                 | 57           |              |
| 48 | Eldorado Cr. (M)  | 2 Sep 84  | 13-02       | 12.75          | 61.45          |            |                 | 24           | 2            |
| 49 | Eldorado Cr. (M)  | 16 Sep 84 | 09-04       | 35             | 49.7           |            | 4               | 35           |              |
| 50 | Eldorado Cr. (M)  | 16 Sep 84 | 18-02       | 85             | 83             |            | 2               | 33           |              |
| 51 | Eldorado Cr. (M)  | 16 Sep 84 | 14-03       | 11.45          | 50.35          |            | 24              | 23           |              |
| 52 | Eldorado Cr. (M)  | 16 Sep 84 | 17-04       | 4.7            | 40             |            |                 | 12           | 1            |
| 53 | Slate Cr. (M)     | 16 Jun 84 | 01-05       |                | 49.85          |            | 5               | 5            |              |
| 54 | Slate Cr. (M)     | 16 Jun 84 | 25-05       | 4.75           | 17.55          |            | 7               | 11           |              |
| 55 | Slate Cr. (M)     | 16 Jun 84 | 20-02       |                | 52.7           |            | 1               | 8            |              |
| 56 | Slate Cr. (M)     | 16 Jun 84 | 23-02       | 7.4            | 9.6            |            | 1               | 4            |              |
| 57 | Slate Cr. (M)     | 30 Jun 84 | 22-03       |                | 51.3           |            | 2               | 3            |              |
| 58 | Slate Cr. (M)     | 30 Jun 84 | 25-01       | 134.5          | 69.25          |            | 1               | 13           |              |
| 59 | Slate Cr. (M)     | 30 Jun 84 | 02-03       |                | 65.95          |            |                 | 3            |              |
| 60 | Slate Cr. (M)     | 30 Jun 84 | 14-02       | 16.5           | 142.6          |            |                 | 8            |              |
| 61 | Slate Cr. (M)     | 23 Jul 84 | 09-01       |                | 9.15           |            | 1               | 31           |              |
| 62 | Slate Cr. (M)     | 23 Jul 84 | 28-02       | 50.6           | 145.3          |            |                 | 193          |              |
| 63 | Slate Cr. (M)     | 23 Jul 84 | 05-04       | 136.8          | 222.5          |            |                 | 163          |              |
| 64 | Slate Cr. (M)     | 23 Jul 84 | 11-00       |                | 38             |            | 1               | 8            |              |
| 65 | Slate Cr. (M)     | 12 Aug 84 | 22-02       |                | 16.6           |            |                 | 16           |              |
| 66 | Slate Cr. (M)     | 12 Aug 84 | 24-03       | 0.8            | 95.1           |            | 1               | 40           |              |
| 67 | Slate Cr. (M)     | 12 Aug 84 | 19-05       | 370.95         | 286.35         |            | 1               | 118          |              |
| 68 | Slate Cr. (M)     | 12 Aug 84 | 01-01       | 6.7            | 54.8           |            | 1               | 19           |              |
| 69 | Slate Cr. (M)     | 2 Sep 84  | 16-03       |                | 200.35         |            |                 | 55           |              |
| 70 | Slate Cr. (M)     | 2 Sep 84  | 07-02       | 5.5            | 50.35          |            | 5               | 23           |              |
| 71 | Slate Cr. (M)     | 2 Sep 84  | 14-05       |                | 79.82          |            |                 | 7            |              |
| 72 | Slate Cr. (M)     | 2 Sep 84  | 09-02       |                | 47.15          |            | 1               | 26           | 1            |
| 73 | Slate Cr. (M)     | 16 Sep 84 | 10-02       |                | 443.8          |            | 4               | 30           |              |
| 74 | Slate Cr. (M)     | 16 Sep 84 | 03-03       |                | 75             |            | 4               | 42           | 1            |
| 75 | Slate Cr. (M)     | 16 Sep 84 | 24-04       |                | 136.8          |            | 5               | 11           |              |
| 76 | Slate Cr. (M)     | 16 Sep 84 | 23-02       |                | 56.4           |            | 2               | 15           |              |
| 77 | Stampede Cr. (UM) | 17 Jun 84 | 00-02       |                | 1191.55        |            |                 |              | 4            |
| 78 | Stampede Cr. (UM) | 17 Jun 84 | 09-00       |                | 141.15         |            | 1               | 3            |              |
| 79 | Stampede Cr. (UM) | 17 Jun 84 | 02-05       |                | 3533           |            |                 | 34           |              |
| 80 | Stampede Cr. (UM) | 17 Jun 84 | 08-02       |                | 1489.85        |            |                 | 4            |              |
| 81 | Stampede Cr. (UM) | 1 Jul 84  | 06-00       |                | 771.65         |            | 3               | 67           |              |
| 82 | Stampede Cr. (UM) | 1 Jul 84  | 08-03       |                | 2124.95        |            | 1               | 158          |              |
| 83 | Stampede Cr. (UM) | 1 Jul 84  | 00-01       |                | 138.85         |            |                 | 35           |              |
| 84 | Stampede Cr. (UM) | 1 Jul 84  | 29-04       |                | 1494.1         |            |                 | 281          |              |
| 85 | Stampede Cr. (UM) | 22 Jul 84 | 23-02       |                | 857.6          |            | 5               | 203          | 4            |
| 86 | Stampede Cr. (UM) | 22 Jul 84 | 00-04       |                | 1517.4         |            | 2               | 34           |              |
| 87 | Stampede Cr. (UM) | 22 Jul 84 | 05-00       |                | 689.85         |            | 1               | 70           |              |
| 88 | Stampede Cr. (UM) | 22 Jul 84 | 30-00       |                | 1373.7         |            |                 | 70           |              |
| 89 | Stampede Cr. (UM) | 11 Aug 84 | 23-04       |                | 422.95         |            |                 | 25           |              |
| 90 | Stampede Cr. (UM) | 11 Aug 84 | 22-01       |                | 2994.35        |            |                 | 56           | 4            |
| 91 | Stampede Cr. (UM) | 11 Aug 84 | 01-01       |                | 3881           |            | 9               | 37           | 14           |
| 92 | Stampede Cr. (UM) | 11 Aug 84 | 02-04       |                | 209.95         |            | 2               | 30           |              |
| 93 | Stampede Cr. (UM) | 1 Sep 84  | 17-04       |                | 561.85         |            |                 | 19           |              |
| 94 | Stampede Cr. (UM) | 1 Sep 84  | 28-04       |                | 5383.55        |            | 1               | 33           |              |
| 95 | Stampede Cr. (UM) | 1 Sep 84  | 12-02       |                | 589.3          |            |                 | 31           |              |
| 96 | Stampede Cr. (UM) | 1 Sep 84  | 22-03       |                | 590.55         |            |                 | 36           |              |
| 97 | Stampede Cr. (UM) | 15 Sep 84 | 08-01       |                | 2976.1         |            | 3               | 45           |              |
| 98 | Stampede Cr. (UM) | 15 Sep 84 | 13-04       |                | 80.6           |            | 1               | 54           |              |

| 1      | 2                | 3           | 4              | 5              | 6          | 7               | 8            | 9            | 10           | 11           |
|--------|------------------|-------------|----------------|----------------|------------|-----------------|--------------|--------------|--------------|--------------|
| STREAM | DATE             | SAMPLE LOC. | MOSS           | CPOM           | Collembola | Diptera         | Diptera      | Diptera      | Diptera      | Diptera      |
|        |                  |             | mg AFDW/g 1 M2 | mg AFDW/g 1 M2 | Collembola | Ceratopogonidae | Chironomidae | Chironomidae | Chironomidae | Chironomidae |
|        |                  |             |                |                |            | unidentified    | larvae       | pupae        | pupae        | pupae        |
| 99     | Stampede Cr (UM) | 15 Sep 84   | 30-03          |                | 1457.55    |                 |              |              | 52           | 4            |
| 100    | Stampede Cr (UM) | 15 Sep 84   | 24-01          | 15.95          | 623.2      | 4               |              |              | 33           |              |
| 101    | Stampede Cr (M)  | 17 Jun 84   | 08-00          |                | 1962       |                 |              |              | 9            |              |
| 102    | Stampede Cr (M)  | 17 Jun 84   | 22-00          |                | 3807       |                 |              |              | 1            |              |
| 103    | Stampede Cr (M)  | 17 Jun 84   | 03-04          |                | 359.35     |                 |              |              | 1            |              |
| 104    | Stampede Cr (M)  | 17 Jun 84   | 00-03          |                | 759.95     |                 |              |              | 1            |              |
| 105    | Stampede Cr (M)  | 1 Jul 84    | 21-01          |                | 705.3      | 2               |              |              | 36           |              |
| 106    | Stampede Cr (M)  | 1 Jul 84    | 00-02          |                | 1018       |                 |              |              | 54           | 1            |
| 107    | Stampede Cr (M)  | 1 Jul 84    | 26-03          |                | 752        |                 |              |              | 14           |              |
| 108    | Stampede Cr (M)  | 1 Jul 84    | 06-04          |                | 156.2      |                 |              |              | 1            |              |
| 109    | Stampede Cr (M)  | 22 Jul 84   | 25-04          |                | 537.85     | 1               |              |              | 25           |              |
| 110    | Stampede Cr (M)  | 22 Jul 84   | 23-03          |                | 1863.3     |                 |              |              | 22           | 2            |
| 111    | Stampede Cr (M)  | 22 Jul 84   | 21-05          |                | 3022.7     | 2               |              |              | 63           | 3            |
| 112    | Stampede Cr (M)  | 22 Jul 84   | 13-02          |                | 4282       | 1               |              |              | 32           | 1            |
| 113    | Stampede Cr (M)  | 11 Aug 84   | 30-03          |                | 295.3      |                 |              |              | 20           | 2            |
| 114    | Stampede Cr (M)  | 11 Aug 84   | 02-04          |                | 1559.6     | 1               |              |              | 60           | 8            |
| 115    | Stampede Cr (M)  | 11 Aug 84   | 29-02          |                | 657.5      |                 |              |              | 32           | 3            |
| 116    | Stampede Cr (M)  | 11 Aug 84   | 22-03          |                | 498.15     | 2               |              |              | 97           |              |
| 117    | Stampede Cr (M)  | 1 Sep 84    | 19-02          |                | 1380.6     |                 |              |              | 47           |              |
| 118    | Stampede Cr (M)  | 1 Sep 84    | 21-04          |                | 1490.3     |                 |              |              | 83           | 2            |
| 119    | Stampede Cr (M)  | 1 Sep 84    | 12-02          |                | 1418.1     |                 |              |              | 87           | 3            |
| 120    | Stampede Cr (M)  | 1 Sep 84    | 18-08          |                | 11338      |                 |              |              | 22           | 1            |
| 121    | Stampede Cr (M)  | 15 Sep 84   | 19-03          |                | 3858       |                 |              |              | 126          |              |
| 122    | Stampede Cr (M)  | 15 Sep 84   | 21-02          |                | 598.65     |                 |              |              | 30           | 1            |
| 123    | Stampede Cr (M)  | 15 Sep 84   | 13-04          |                | 5988       |                 |              |              | 118          | 2            |
| 124    | Stampede Cr (M)  | 15 Sep 84   | 03-03          |                | 4643       |                 |              |              | 45           | 4            |
| 125    | Jumbo Cr (UM)    | 18 Jun 84   | 05-06          | 456.1          | 143.4      | 1               |              | 1            | 140          |              |
| 126    | Jumbo Cr (UM)    | 18 Jun 84   | 07-08          | 2171.65        | 611.1      |                 |              |              | 575          | 7            |
| 127    | Jumbo Cr (UM)    | 18 Jun 84   | 03-01          | 602.45         | 44.2       | 1               |              |              | 136          | 5            |
| 128    | Jumbo Cr (UM)    | 18 Jun 84   | 02-21          | 3945           | 474.3      | 1               |              |              | 314          | 16           |
| 129    | Jumbo Cr (UM)    | 2 Jul 84    | 27-04          | 334.3          | 114        | 1               |              |              | 490          | 8            |
| 130    | Jumbo Cr (UM)    | 2 Jul 84    | 06-02          | 698.65         | 1364.9     | 1               |              |              | 337          | 4            |
| 131    | Jumbo Cr (UM)    | 2 Jul 84    | 30-05          | 14             | 74.4       |                 |              |              | 222          |              |
| 132    | Jumbo Cr (UM)    | 2 Jul 84    | 20-07          | 255.15         | 223.45     | 1               |              |              | 177          | 8            |
| 133    | Jumbo Cr (UM)    | 21 Jul 84   | 29-03          | 1925.4         | 198        |                 |              |              | 260          | 91           |
| 134    | Jumbo Cr (UM)    | 21 Jul 84   | 12-06          | 632.5          | 209.5      | 2               |              |              | 349          | 31           |
| 135    | Jumbo Cr (UM)    | 21 Jul 84   | 09-02          | 445.35         | 140.6      | 5               |              |              | 388          |              |
| 136    | Jumbo Cr (UM)    | 21 Jul 84   | 24-04          | 740.35         | 92.6       |                 |              |              | 468          |              |
| 137    | Jumbo Cr (UM)    | 13 Aug 84   | 11-03          | 1191.1         | 29.75      | 2               |              |              | 1074         |              |
| 138    | Jumbo Cr (UM)    | 13 Aug 84   | 06-03          | 45             | 17.85      |                 |              |              | 314          | 1            |
| 139    | Jumbo Cr (UM)    | 13 Aug 84   | 04-03          | 315.65         | 268.95     |                 |              |              | 381          | 18           |
| 140    | Jumbo Cr (UM)    | 13 Aug 84   | 09-05          | 1553.15        | 189.7      | 7               |              |              | 743          | 15           |
| 141    | Jumbo Cr (UM)    | 3 Sep 84    | 14-03          | 104.7          | 64.2       |                 |              |              | 90           | 16           |
| 142    | Jumbo Cr (UM)    | 3 Sep 84    | 28-05          | 80.95          | 264.2      | 1               |              |              | 291          |              |
| 143    | Jumbo Cr (UM)    | 3 Sep 84    | 11-13          | 693.15         | 450.7      | 4               |              |              | 1            |              |
| 144    | Jumbo Cr (UM)    | 3 Sep 84    | 25-06          | 2152.95        | 265.15     | 1               |              |              | 208          |              |
| 145    | Jumbo Cr (UM)    | 17 Sep 84   | 06-04          | 374.4          | 98.35      | 4               |              |              | 368          |              |
| 146    | Jumbo Cr (UM)    | 17 Sep 84   | 12-03          | 416.55         | 7          | 1               |              |              | 373          | 3            |
| 147    | Jumbo Cr (UM)    | 17 Sep 84   | 07-10          | 73.4           | 71.05      |                 |              |              | 52           |              |
| 148    | Jumbo Cr (UM)    | 17 Sep 84   | 15-08          | 250.15         | 57.35      |                 |              |              | 61           | 1            |
| 149    |                  |             |                |                |            |                 |              |              |              |              |
| 150    | GRAND TOTAL      |             |                | 149616.7       | 103140.82  | 0               | 345          | 9            | 80354        | 1062         |
| 151    | ELD/COUNT        |             |                | 23             | 23         | 0               | 22           | 1            | 24           | 13           |
| 152    | ELD/MIC/COUNT    |             |                | 23             | 24         | 0               | 15           | 0            | 24           | 9            |
| 153    | SLATE(M) COUNT   |             |                | 10             | 24         | 0               | 17           | 0            | 24           | 3            |
| 154    | STAMPEDE COUNT   |             |                | 1              | 24         | 0               | 12           | 0            | 23           | 5            |
| 155    | STAMP(M) COUNT   |             |                | 0              | 24         | 0               | 6            | 0            | 24           | 13           |
| 156    | JUMBO COUNT      |             |                | 24             | 24         | 0               | 15           | 1            | 24           | 14           |



| 1      | 2                 | 3           | 4     | 12             | 13        | 14        | 15         | 16           | 17 | 18         |
|--------|-------------------|-------------|-------|----------------|-----------|-----------|------------|--------------|----|------------|
| STREAM | DATE              | SAMPLE LOC. |       | Diptera        | Diptera   | Diptera   | Diptera    | Diptera      |    | Diptera    |
|        |                   |             |       | Dolichopodidae | Empididae | Empididae | Empididae  | Empididae    |    | Simuliidae |
|        |                   |             |       | unidentified   | Chelifera | Clinocera | Oreogelion | unidentified |    | Gymnops    |
| 5      | Eldorado Cr. (UM) | 16 Jun 84   | 26-04 |                |           |           |            |              |    |            |
| 6      | Eldorado Cr. (UM) | 16 Jun 84   | 02-02 |                |           |           |            |              |    |            |
| 7      | Eldorado Cr. (UM) | 16 Jun 84   | 06-04 |                |           | 1         |            |              |    |            |
| 8      | Eldorado Cr. (UM) | 16 Jun 84   | 04-05 |                |           |           |            |              |    |            |
| 9      | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |                |           |           |            |              |    |            |
| 10     | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |                |           |           |            |              |    |            |
| 11     | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |                | 1         |           |            |              |    |            |
| 12     | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 |                | 1         |           |            |              |    |            |
| 13     | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |                | 1         |           |            |              |    |            |
| 14     | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |                |           |           |            |              |    |            |
| 15     | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 |                |           |           |            |              |    | 3          |
| 16     | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 |                | 1         |           |            |              |    | 2          |
| 17     | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |                |           |           |            |              |    |            |
| 18     | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |                | 5         |           |            |              |    |            |
| 19     | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 |                |           |           |            |              |    | 2          |
| 20     | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |                |           |           |            |              |    |            |
| 21     | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |                | 1         |           |            |              |    |            |
| 22     | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 |                | 2         |           |            |              |    |            |
| 23     | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |                | 2         |           |            |              |    |            |
| 24     | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |                | 2         |           |            |              |    |            |
| 25     | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |                |           |           |            |              |    |            |
| 26     | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |                | 1         |           | 1          |              |    |            |
| 27     | Eldorado Cr. (UM) | 16 Sep 84   | 08-02 |                |           |           |            |              |    |            |
| 28     | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |                | 1         |           |            |              |    |            |
| 29     | Eldorado Cr. (M)  | 16 Jun 84   | 08-04 |                | 1         |           | 1          |              |    |            |
| 30     | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |                |           |           |            |              |    |            |
| 31     | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |                |           |           |            |              |    |            |
| 32     | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |                |           |           |            |              |    |            |
| 33     | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |                | 1         |           | 1          |              |    |            |
| 34     | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |                |           |           |            | 2            |    |            |
| 35     | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |                |           |           |            |              |    |            |
| 36     | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |                |           |           | 1          |              |    |            |
| 37     | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |                | 1         |           |            |              |    |            |
| 38     | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |                |           |           | 5          |              |    |            |
| 39     | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |                | 2         |           | 7          |              |    | 2          |
| 40     | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |                |           |           |            | 2            |    |            |
| 41     | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |                |           |           | 1          |              |    |            |
| 42     | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 |                | 1         |           | 1          |              |    |            |
| 43     | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |                |           |           | 7          |              |    |            |
| 44     | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |                |           |           | 3          |              |    |            |
| 45     | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |                |           |           |            | 4            |    |            |
| 46     | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |                |           |           | 1          |              |    |            |
| 47     | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |                |           |           | 3          |              |    |            |
| 48     | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 |                |           | 1         | 2          | 1            |    |            |
| 49     | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |                |           |           | 7          |              |    |            |
| 50     | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |                |           |           | 4          |              |    |            |
| 51     | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |                |           |           | 1          |              |    |            |
| 52     | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |                |           |           |            |              |    |            |
| 53     | Slate Cr. (M)     | 16 Jun 84   | 01-05 |                |           |           |            | 2            |    |            |
| 54     | Slate Cr. (M)     | 16 Jun 84   | 25-05 |                | 1         |           |            |              |    |            |
| 55     | Slate Cr. (M)     | 16 Jun 84   | 20-02 |                |           |           |            |              |    |            |
| 56     | Slate Cr. (M)     | 16 Jun 84   | 23-02 |                |           |           | 4          |              |    |            |
| 57     | Slate Cr. (M)     | 30 Jun 84   | 22-03 |                |           |           |            |              |    |            |
| 58     | Slate Cr. (M)     | 30 Jun 84   | 25-01 |                |           |           |            | 3            |    |            |
| 59     | Slate Cr. (M)     | 30 Jun 84   | 02-03 |                |           |           | 4          |              |    |            |
| 60     | Slate Cr. (M)     | 30 Jun 84   | 14-02 |                |           |           | 1          |              |    |            |
| 61     | Slate Cr. (M)     | 23 Jul 84   | 09-01 |                |           |           | 2          |              |    |            |
| 62     | Slate Cr. (M)     | 23 Jul 84   | 28-02 |                |           |           | 5          |              |    |            |
| 63     | Slate Cr. (M)     | 23 Jul 84   | 05-04 |                |           | 1         | 7          |              |    |            |
| 64     | Slate Cr. (M)     | 23 Jul 84   | 11-00 |                |           |           |            |              |    |            |
| 65     | Slate Cr. (M)     | 12 Aug 84   | 22-02 |                |           |           |            |              |    |            |
| 66     | Slate Cr. (M)     | 12 Aug 84   | 24-03 |                |           |           | 5          |              |    |            |
| 67     | Slate Cr. (M)     | 12 Aug 84   | 19-05 |                |           |           |            |              |    |            |
| 68     | Slate Cr. (M)     | 12 Aug 84   | 01-01 |                |           |           | 2          |              |    |            |
| 69     | Slate Cr. (M)     | 2 Sep 84    | 16-03 |                |           |           | 6          |              |    |            |
| 70     | Slate Cr. (M)     | 2 Sep 84    | 07-02 |                |           |           | 1          |              |    |            |
| 71     | Slate Cr. (M)     | 2 Sep 84    | 14-05 |                |           |           | 3          |              |    |            |
| 72     | Slate Cr. (M)     | 2 Sep 84    | 09-02 |                | 1         |           |            |              |    |            |
| 73     | Slate Cr. (M)     | 16 Sep 84   | 10-02 |                |           |           | 3          |              |    |            |
| 74     | Slate Cr. (M)     | 16 Sep 84   | 03-03 |                |           |           |            | 1            |    |            |
| 75     | Slate Cr. (M)     | 16 Sep 84   | 24-04 |                |           |           |            |              |    |            |
| 76     | Slate Cr. (M)     | 16 Sep 84   | 23-02 |                |           |           | 3          |              |    |            |
| 77     | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |                |           |           |            |              |    |            |
| 78     | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |                |           |           |            |              |    |            |
| 79     | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |                |           |           |            |              |    |            |
| 80     | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |                |           |           |            |              |    |            |
| 81     | Stampede Cr. (UM) | 1 Jul 84    | 06-00 |                |           |           |            |              |    |            |
| 82     | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |                |           |           |            |              |    |            |
| 83     | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |                |           |           |            |              |    | 1          |
| 84     | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |                |           |           |            |              |    |            |
| 85     | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |                |           |           |            |              |    | 10         |
| 86     | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |                |           |           |            |              |    | 4          |
| 87     | Stampede Cr. (UM) | 22 Jul 84   | 05-00 |                |           |           |            |              |    | 5          |
| 88     | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |                |           |           |            |              |    | 4          |
| 89     | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |                | 1         |           |            | 1            |    | 5          |
| 90     | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |                |           |           |            |              |    |            |
| 91     | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |                |           |           |            |              |    | 20         |
| 92     | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |                |           |           |            |              |    | 1          |
| 93     | Stampede Cr. (UM) | 1 Sep 84    | 17-04 |                |           |           |            |              |    | 3          |
| 94     | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |                |           |           |            |              |    | 2          |
| 95     | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |                |           |           |            |              |    | 4          |
| 96     | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |                |           |           |            |              |    | 4          |
| 97     | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |                |           |           |            |              |    | 1          |
| 98     | Stampede Cr. (UM) | 15 Sep 84   | 13-04 |                |           |           |            |              |    | 2          |

| 1   | 2                | 3         | 4           | 12             | 13         | 14        | 15         | 16           | 17 | 18         |
|-----|------------------|-----------|-------------|----------------|------------|-----------|------------|--------------|----|------------|
| 1   | STREAM           | DATE      | SAMPLE LOC. | Diptera        | Diptera    | Diptera   | Diptera    | Diptera      |    | Diptera    |
| 2   |                  |           |             | Dolichopodidae | Empididae  | Empididae | Empididae  | Empididae    |    | Simuliidae |
| 3   |                  |           |             | unidentified   | Cheliteria | Clinocera | Oreogaster | unidentified |    | Gymnops    |
| 4   |                  |           |             |                |            |           |            |              |    |            |
| 99  | Stampede Cr (UM) | 15 Sep 84 | 30-03       |                |            |           |            |              |    |            |
| 100 | Stampede Cr (UM) | 15 Sep 84 | 24-01       |                |            |           |            |              |    | 3          |
| 101 | Stampede Cr (M)  | 17 Jun 84 | 08-00       |                |            |           |            |              |    |            |
| 102 | Stampede Cr (M)  | 17 Jun 84 | 22-00       |                |            |           |            |              |    |            |
| 103 | Stampede Cr (M)  | 17 Jun 84 | 03-04       |                |            |           |            |              |    |            |
| 104 | Stampede Cr (M)  | 17 Jun 84 | 00-03       |                |            |           |            |              |    |            |
| 105 | Stampede Cr (M)  | 1 Jul 84  | 21-01       |                |            |           |            |              |    |            |
| 106 | Stampede Cr (M)  | 1 Jul 84  | 00-02       |                |            |           |            |              |    | 1          |
| 107 | Stampede Cr (M)  | 1 Jul 84  | 26-03       |                |            |           |            |              |    |            |
| 108 | Stampede Cr (M)  | 1 Jul 84  | 06-04       |                |            |           |            |              |    |            |
| 109 | Stampede Cr (M)  | 22 Jul 84 | 25-04       |                |            |           |            |              |    | 2          |
| 110 | Stampede Cr (M)  | 22 Jul 84 | 23-03       | 2              |            |           |            |              |    |            |
| 111 | Stampede Cr (M)  | 22 Jul 84 | 21-05       |                |            |           |            |              |    | 4          |
| 112 | Stampede Cr (M)  | 22 Jul 84 | 13-02       | 1              |            |           |            |              |    | 1          |
| 113 | Stampede Cr (M)  | 11 Aug 84 | 30-03       |                |            |           |            |              |    | 9          |
| 114 | Stampede Cr (M)  | 11 Aug 84 | 02-04       |                |            |           |            |              |    | 20         |
| 115 | Stampede Cr (M)  | 11 Aug 84 | 29-02       |                |            |           |            |              |    | 2          |
| 116 | Stampede Cr (M)  | 11 Aug 84 | 22-03       |                |            |           |            |              |    | 6          |
| 117 | Stampede Cr (M)  | 11 Sep 84 | 19-02       |                |            |           |            |              |    | 3          |
| 118 | Stampede Cr (M)  | 11 Sep 84 | 21-04       |                |            |           |            |              |    | 4          |
| 119 | Stampede Cr (M)  | 1 Sep 84  | 12-02       |                |            |           |            |              |    | 4          |
| 120 | Stampede Cr (M)  | 1 Sep 84  | 18-06       | 1              |            |           |            |              |    | 2          |
| 121 | Stampede Cr (M)  | 15 Sep 84 | 19-03       |                |            |           |            |              |    | 3          |
| 122 | Stampede Cr (M)  | 15 Sep 84 | 21-02       |                |            |           |            |              |    |            |
| 123 | Stampede Cr (M)  | 15 Sep 84 | 13-04       | 1              |            |           |            |              |    | 3          |
| 124 | Stampede Cr (M)  | 15 Sep 84 | 03-03       |                |            |           |            |              |    | 1          |
| 125 | Jumbo Cr (UM)    | 18 Jun 84 | 05-06       |                |            |           |            |              |    |            |
| 126 | Jumbo Cr (UM)    | 18 Jun 84 | 07-08       |                |            |           |            |              |    |            |
| 127 | Jumbo Cr (UM)    | 18 Jun 84 | 03-01       |                |            |           |            |              |    |            |
| 128 | Jumbo Cr (UM)    | 18 Jun 84 | 02-21       |                |            |           |            |              |    |            |
| 129 | Jumbo Cr (UM)    | 2 Jul 84  | 27-04       |                |            |           | 1          |              |    |            |
| 130 | Jumbo Cr (UM)    | 2 Jul 84  | 06-02       |                |            |           |            |              |    |            |
| 131 | Jumbo Cr (UM)    | 2 Jul 84  | 30-05       |                |            |           |            | 2            |    |            |
| 132 | Jumbo Cr (UM)    | 2 Jul 84  | 20-07       |                |            |           |            |              |    |            |
| 133 | Jumbo Cr (UM)    | 21 Jul 84 | 29-03       |                |            |           |            |              |    |            |
| 134 | Jumbo Cr (UM)    | 21 Jul 84 | 12-06       |                |            | 1         | 1          |              |    |            |
| 135 | Jumbo Cr (UM)    | 21 Jul 84 | 09-02       |                |            |           |            |              |    |            |
| 136 | Jumbo Cr (UM)    | 21 Jul 84 | 24-04       |                |            |           |            |              |    |            |
| 137 | Jumbo Cr (UM)    | 13 Aug 84 | 11-03       |                |            |           |            | 2            |    |            |
| 138 | Jumbo Cr (UM)    | 13 Aug 84 | 06-03       |                |            |           |            |              |    |            |
| 139 | Jumbo Cr (UM)    | 13 Aug 84 | 04-03       |                | 1          |           |            |              |    |            |
| 140 | Jumbo Cr (UM)    | 13 Aug 84 | 09-05       |                |            |           | 2          |              |    |            |
| 141 | Jumbo Cr (UM)    | 3 Sep 84  | 14-03       |                |            |           |            |              |    |            |
| 142 | Jumbo Cr (UM)    | 3 Sep 84  | 28-05       |                |            |           |            |              |    |            |
| 143 | Jumbo Cr (UM)    | 3 Sep 84  | 11-13       |                |            |           |            |              |    |            |
| 144 | Jumbo Cr (UM)    | 3 Sep 84  | 25-06       |                |            |           |            |              |    |            |
| 145 | Jumbo Cr (UM)    | 17 Sep 84 | 06-04       |                |            |           | 1          | 2            |    | 1          |
| 146 | Jumbo Cr (UM)    | 17 Sep 84 | 12-03       |                |            |           |            |              |    |            |
| 147 | Jumbo Cr (UM)    | 17 Sep 84 | 07-10       |                |            |           |            |              |    |            |
| 148 | Jumbo Cr (UM)    | 17 Sep 84 | 15-08       |                |            |           |            |              |    |            |
| 149 |                  |           |             |                |            |           |            |              |    |            |
| 150 | GRAND TOTAL      |           |             | 5              | 30         | 2         | 99         | 20           |    | 144        |
| 151 | ELD/COUNT        |           |             | 0              | 12         | 0         | 1          | 0            | 0  | 3          |
| 152 | ELD/MIC/COUNT    |           |             | 0              | 5          | 1         | 16         | 3            | 0  | 1          |
| 153 | SLATE(M) COUNT   |           |             | 0              | 3          | 0         | 13         | 3            | 0  | 0          |
| 154 | STAMPEDE COUNT   |           |             | 0              | 1          | 0         | 0          | 1            | 0  | 15         |
| 155 | STAMP(M) COUNT   |           |             | 4              | 0          | 0         | 0          | 0            | 0  | 15         |
| 156 | JUMBO COUNT      |           |             | 0              | 1          | 1         | 4          | 3            | 0  | 1          |

| 1  | 2                 | 3           | 4     | 19          | 20          | 21         | 22         | 23           | 24            | 25        |
|----|-------------------|-------------|-------|-------------|-------------|------------|------------|--------------|---------------|-----------|
| 1  | DATE              | SAMPLE LOC. |       | Diptera     | Diptera     | Diptera    | Diptera    | Diptera      | Diptera       | Diptera   |
| 2  |                   |             |       | Simuliidae  | Simuliidae  | Simuliidae | Simuliidae | Simuliidae   | Stratiomyidae | Tabanidae |
| 3  |                   |             |       | Metatoposia | Prosimulium | Simulium   | pupae      | undetermined |               |           |
| 4  |                   |             |       |             |             |            |            |              |               |           |
| 5  | Eldorado Cr. (UM) | 18 Jun 84   | 28-04 |             | 85          |            |            |              |               | 1         |
| 6  | Eldorado Cr. (UM) | 18 Jun 84   | 02-02 |             |             |            |            |              |               |           |
| 7  | Eldorado Cr. (UM) | 18 Jun 84   | 06-04 |             |             |            |            |              | 1             |           |
| 8  | Eldorado Cr. (UM) | 18 Jun 84   | 04-05 |             | 4           |            |            |              |               |           |
| 9  | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |             |             |            |            |              |               |           |
| 10 | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |             |             |            |            |              |               |           |
| 11 | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |             |             |            |            |              |               |           |
| 12 | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 |             |             |            |            |              |               |           |
| 13 | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |             |             | 1          |            |              |               |           |
| 14 | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |             | 10          |            |            |              |               |           |
| 15 | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 |             |             |            |            |              |               |           |
| 16 | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 |             | 1           |            | 4          |              |               |           |
| 17 | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |             | 51          |            |            |              |               |           |
| 18 | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |             | 10          |            |            |              |               |           |
| 19 | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 |             | 1           | 16         |            |              |               |           |
| 20 | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |             |             |            |            |              |               |           |
| 21 | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |             |             | 1          |            |              |               |           |
| 22 | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 |             |             | 20         |            |              |               |           |
| 23 | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |             |             | 116        |            | 1            |               |           |
| 24 | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |             |             | 1          |            |              |               |           |
| 25 | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |             |             |            |            |              |               |           |
| 26 | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |             |             |            |            |              |               |           |
| 27 | Eldorado Cr. (UM) | 16 Sep 84   | 06-02 |             |             |            |            | 1            |               |           |
| 28 | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |             | 1           |            |            |              |               |           |
| 29 | Eldorado Cr. (M)  | 16 Jun 84   | 06-04 |             | 1           |            |            |              | 1             |           |
| 30 | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |             |             |            |            |              |               |           |
| 31 | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |             |             |            |            |              |               |           |
| 32 | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |             |             |            |            |              |               |           |
| 33 | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |             |             | 1          |            |              |               |           |
| 34 | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |             |             | 1          |            |              |               |           |
| 35 | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |             |             | 1          |            |              |               |           |
| 36 | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |             |             |            |            |              |               |           |
| 37 | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |             |             | 2          |            |              |               |           |
| 38 | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |             |             |            |            |              |               |           |
| 39 | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |             | 1           | 1          |            |              |               |           |
| 40 | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |             |             |            |            |              |               |           |
| 41 | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |             |             | 1          |            |              |               |           |
| 42 | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 |             |             |            |            |              |               |           |
| 43 | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |             |             | 3          |            |              |               |           |
| 44 | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |             |             |            |            |              |               |           |
| 45 | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |             |             |            |            |              |               |           |
| 46 | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |             |             |            |            |              |               |           |
| 47 | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |             |             | 1          |            |              |               |           |
| 48 | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 |             |             |            |            |              |               |           |
| 49 | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |             |             | 1          |            |              |               |           |
| 50 | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |             |             | 7          |            |              |               |           |
| 51 | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |             |             | 1          |            |              |               |           |
| 52 | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |             |             |            |            |              |               |           |
| 53 | Slate Cr. (M)     | 18 Jun 84   | 01-05 |             |             |            |            |              |               |           |
| 54 | Slate Cr. (M)     | 18 Jun 84   | 25-05 |             |             |            |            |              |               |           |
| 55 | Slate Cr. (M)     | 18 Jun 84   | 20-02 |             |             |            |            |              |               |           |
| 56 | Slate Cr. (M)     | 18 Jun 84   | 23-02 |             |             |            |            |              |               |           |
| 57 | Slate Cr. (M)     | 30 Jun 84   | 22-03 |             |             |            |            |              |               |           |
| 58 | Slate Cr. (M)     | 30 Jun 84   | 25-01 |             |             | 3          |            |              |               |           |
| 59 | Slate Cr. (M)     | 30 Jun 84   | 02-03 |             |             | 2          |            |              |               |           |
| 60 | Slate Cr. (M)     | 30 Jun 84   | 14-02 |             | 2           |            |            |              |               |           |
| 61 | Slate Cr. (M)     | 23 Jul 84   | 09-01 |             |             |            |            |              |               |           |
| 62 | Slate Cr. (M)     | 23 Jul 84   | 28-02 |             |             | 1          |            |              |               |           |
| 63 | Slate Cr. (M)     | 23 Jul 84   | 05-04 |             |             |            | 9          |              |               |           |
| 64 | Slate Cr. (M)     | 23 Jul 84   | 11-00 |             |             |            |            |              |               |           |
| 65 | Slate Cr. (M)     | 12 Aug 84   | 22-02 |             |             |            |            |              |               |           |
| 66 | Slate Cr. (M)     | 12 Aug 84   | 24-03 |             |             |            |            |              |               |           |
| 67 | Slate Cr. (M)     | 12 Aug 84   | 19-05 |             |             |            |            |              |               |           |
| 68 | Slate Cr. (M)     | 12 Aug 84   | 01-01 |             |             |            |            |              |               |           |
| 69 | Slate Cr. (M)     | 2 Sep 84    | 16-03 |             |             |            |            |              |               |           |
| 70 | Slate Cr. (M)     | 2 Sep 84    | 07-02 |             |             |            |            |              |               |           |
| 71 | Slate Cr. (M)     | 2 Sep 84    | 14-05 |             |             | 1          |            |              |               |           |
| 72 | Slate Cr. (M)     | 2 Sep 84    | 09-02 |             |             |            |            |              |               |           |
| 73 | Slate Cr. (M)     | 16 Sep 84   | 10-02 |             |             |            |            |              | 2             |           |
| 74 | Slate Cr. (M)     | 16 Sep 84   | 03-03 |             |             | 4          |            |              |               |           |
| 75 | Slate Cr. (M)     | 16 Sep 84   | 24-04 |             |             | 2          |            |              |               |           |
| 76 | Slate Cr. (M)     | 16 Sep 84   | 23-02 |             |             |            |            |              |               |           |
| 77 | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |             |             |            |            |              |               |           |
| 78 | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |             |             |            |            |              |               |           |
| 79 | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |             |             |            |            |              |               |           |
| 80 | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |             |             |            |            |              |               |           |
| 81 | Stampede Cr. (UM) | 1 Jul 84    | 06-00 |             |             |            |            |              | 2             |           |
| 82 | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |             |             |            |            |              |               |           |
| 83 | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |             |             |            |            |              |               |           |
| 84 | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |             |             |            |            |              |               |           |
| 85 | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |             |             |            |            | 1            |               |           |
| 86 | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |             |             |            |            |              |               |           |
| 87 | Stampede Cr. (UM) | 22 Jul 84   | 05-00 |             |             |            |            |              |               |           |
| 88 | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |             |             |            |            |              |               |           |
| 89 | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |             |             |            |            |              |               |           |
| 90 | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |             |             | 28         |            |              |               |           |
| 91 | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |             |             |            |            |              |               | 1         |
| 92 | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |             |             |            |            |              |               |           |
| 93 | Stampede Cr. (UM) | 1 Sep 84    | 17-04 |             |             |            |            |              |               |           |
| 94 | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |             |             |            |            |              |               |           |
| 95 | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |             |             |            |            |              |               |           |
| 96 | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |             |             |            |            |              |               |           |
| 97 | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |             |             |            |            |              | 1             |           |
| 98 | Stampede Cr. (UM) | 15 Sep 84   | 13-04 |             |             |            |            |              |               |           |

| 1   | STREAM           | DATE      | SAMPLE LOC | 19 | 20  | 21 | 22 | 23 | 24 | 25 |
|-----|------------------|-----------|------------|----|-----|----|----|----|----|----|
| 99  | Stampede Cr (UM) | 15 Sep 84 | 30-03      |    |     |    |    |    |    |    |
| 100 | Stampede Cr (UM) | 15 Sep 84 | 24-01      |    |     |    |    |    |    |    |
| 101 | Stampede Cr (UM) | 17 Jun 84 | 08-00      |    |     |    |    |    |    |    |
| 102 | Stampede Cr (M)  | 17 Jun 84 | 22-00      |    |     |    |    |    |    |    |
| 103 | Stampede Cr (M)  | 17 Jun 84 | 03-04      |    |     |    |    |    |    |    |
| 104 | Stampede Cr (M)  | 17 Jun 84 | 00-03      |    |     |    |    |    |    |    |
| 105 | Stampede Cr (M)  | 1 Jul 84  | 21-01      |    |     |    |    |    |    |    |
| 106 | Stampede Cr (M)  | 1 Jul 84  | 00-02      |    |     |    |    |    |    |    |
| 107 | Stampede Cr (M)  | 1 Jul 84  | 26-03      |    |     |    |    |    |    |    |
| 108 | Stampede Cr (M)  | 1 Jul 84  | 06-04      |    |     |    |    |    |    |    |
| 109 | Stampede Cr (M)  | 22 Jul 84 | 25-04      |    |     |    |    |    |    |    |
| 110 | Stampede Cr (M)  | 22 Jul 84 | 23-03      |    |     |    |    |    |    |    |
| 111 | Stampede Cr (M)  | 22 Jul 84 | 21-05      |    |     |    |    |    |    |    |
| 112 | Stampede Cr (M)  | 22 Jul 84 | 13-02      |    |     |    |    |    |    |    |
| 113 | Stampede Cr (M)  | 11 Aug 84 | 30-03      |    |     |    |    |    |    |    |
| 114 | Stampede Cr (M)  | 11 Aug 84 | 02-04      |    |     |    |    |    |    |    |
| 115 | Stampede Cr (M)  | 11 Aug 84 | 29-02      |    |     |    |    |    |    |    |
| 116 | Stampede Cr (M)  | 11 Aug 84 | 22-03      |    |     |    |    |    |    |    |
| 117 | Stampede Cr (M)  | 1 Sep 84  | 19-02      |    |     |    |    |    |    |    |
| 118 | Stampede Cr (M)  | 1 Sep 84  | 21-04      |    |     |    |    |    |    |    |
| 119 | Stampede Cr (M)  | 1 Sep 84  | 12-02      |    |     |    |    |    |    |    |
| 120 | Stampede Cr (M)  | 1 Sep 84  | 18-06      |    |     |    |    |    |    |    |
| 121 | Stampede Cr (M)  | 15 Sep 84 | 19-03      |    |     |    |    |    |    |    |
| 122 | Stampede Cr (M)  | 15 Sep 84 | 21-02      |    |     |    |    |    |    |    |
| 123 | Stampede Cr (M)  | 15 Sep 84 | 13-04      |    |     |    |    |    |    |    |
| 124 | Stampede Cr (M)  | 15 Sep 84 | 03-03      |    |     |    |    |    |    |    |
| 125 | Stampede Cr (UM) | 18 Jun 84 | 05-06      |    |     |    |    |    |    |    |
| 126 | Stampede Cr (UM) | 18 Jun 84 | 07-08      |    |     |    |    |    |    |    |
| 127 | Stampede Cr (UM) | 18 Jun 84 | 03-01      |    |     |    |    |    |    |    |
| 128 | Stampede Cr (UM) | 18 Jun 84 | 02-21      |    |     |    |    |    |    |    |
| 129 | Stampede Cr (UM) | 2 Jul 84  | 27-04      |    |     |    |    |    |    |    |
| 130 | Stampede Cr (UM) | 2 Jul 84  | 06-02      |    |     |    |    |    |    |    |
| 131 | Stampede Cr (UM) | 2 Jul 84  | 30-05      |    |     |    |    |    |    |    |
| 132 | Stampede Cr (UM) | 2 Jul 84  | 20-07      |    |     |    |    |    |    |    |
| 133 | Stampede Cr (UM) | 21 Jul 84 | 29-03      |    |     |    |    |    |    |    |
| 134 | Stampede Cr (UM) | 21 Jul 84 | 12-06      |    |     |    |    |    |    |    |
| 135 | Stampede Cr (UM) | 21 Jul 84 | 09-02      |    |     |    |    |    |    |    |
| 136 | Stampede Cr (UM) | 21 Jul 84 | 24-04      |    |     |    |    |    |    |    |
| 137 | Stampede Cr (UM) | 13 Aug 84 | 11-03      |    |     |    |    |    |    |    |
| 138 | Stampede Cr (UM) | 13 Aug 84 | 08-03      |    |     |    |    |    |    |    |
| 139 | Stampede Cr (UM) | 13 Aug 84 | 04-03      |    |     |    |    |    |    |    |
| 140 | Stampede Cr (UM) | 3 Sep 84  | 09-05      |    |     |    |    |    |    |    |
| 141 | Stampede Cr (UM) | 3 Sep 84  | 14-03      |    |     |    |    |    |    |    |
| 142 | Stampede Cr (UM) | 3 Sep 84  | 28-05      |    |     |    |    |    |    |    |
| 143 | Stampede Cr (UM) | 3 Sep 84  | 11-13      |    |     |    |    |    |    |    |
| 144 | Stampede Cr (UM) | 3 Sep 84  | 25-06      |    |     |    |    |    |    |    |
| 145 | Stampede Cr (UM) | 17 Sep 84 | 06-04      |    |     |    |    |    |    |    |
| 146 | Stampede Cr (UM) | 17 Sep 84 | 12-03      |    |     |    |    |    |    |    |
| 147 | Stampede Cr (UM) | 17 Sep 84 | 07-10      |    |     |    |    |    |    |    |
| 148 | Stampede Cr (UM) | 17 Sep 84 | 15-08      |    |     |    |    |    |    |    |
| 149 | Stampede Cr (UM) |           |            |    |     |    |    |    |    |    |
| 150 | GRAND TOTAL      |           |            | 4  | 419 | 10 | 15 | 9  | 2  | 1  |
| 151 | BLIND COUNT      |           |            |    |     |    |    |    |    |    |
| 152 | BLIND COUNT      |           |            |    |     |    |    |    |    |    |
| 153 | SLATE (M) COUNT  |           |            |    |     |    |    |    |    |    |
| 154 | SLATE (M) COUNT  |           |            |    |     |    |    |    |    |    |
| 155 | STAMPED COUNT    |           |            |    |     |    |    |    |    |    |
| 156 | JUMBO COUNT      |           |            |    |     |    |    |    |    |    |

| 1      | 2                 | 3           | 4     | 25        | 27         | 28        | 29         | 30         | 31        | 32        |
|--------|-------------------|-------------|-------|-----------|------------|-----------|------------|------------|-----------|-----------|
| STREAM | DATE              | SAMPLE LOC. |       | Diptera   | Diptera    | Diptera   | Diptera    | Diptera    | Diptera   | Diptera   |
|        |                   |             |       | Tipulidae | Tipulidae  | Tipulidae | Tipulidae  | Tipulidae  | Tipulidae | Tipulidae |
|        |                   |             |       | Dicranota | Gonomyidae | Hexatoma  | Molophilus | Oreogelion | Pedicia   | Tipula    |
| 5      | Eldorado Cr. (UM) | 16 Jun 84   | 26-04 |           |            |           |            | 1          |           |           |
| 6      | Eldorado Cr. (UM) | 16 Jun 84   | 02-02 |           |            |           |            |            |           |           |
| 7      | Eldorado Cr. (UM) | 16 Jun 84   | 06-04 |           |            |           |            |            |           | 1         |
| 8      | Eldorado Cr. (UM) | 16 Jun 84   | 04-05 |           |            |           |            |            |           |           |
| 9      | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |           |            |           |            |            |           |           |
| 10     | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |           |            |           | 2          |            |           |           |
| 11     | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |           | 1          |           |            |            |           |           |
| 12     | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 |           | 1          |           |            |            |           |           |
| 13     | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |           | 2          |           |            |            |           | 1         |
| 14     | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |           |            |           |            |            |           |           |
| 15     | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 |           | 2          |           |            |            |           |           |
| 16     | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 |           |            |           |            |            |           |           |
| 17     | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |           | 4          |           |            |            |           |           |
| 18     | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |           | 6          |           |            |            |           |           |
| 19     | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 |           | 7          |           |            |            |           |           |
| 20     | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |           | 2          |           |            | 2          |           |           |
| 21     | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |           | 23         |           |            |            |           |           |
| 22     | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 |           | 5          |           |            |            |           |           |
| 23     | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |           | 21         |           |            |            |           |           |
| 24     | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |           | 12         |           |            |            |           |           |
| 25     | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |           |            |           | 2          |            |           |           |
| 26     | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |           | 19         |           | 1          |            | 1         |           |
| 27     | Eldorado Cr. (UM) | 16 Sep 84   | 06-02 |           |            |           |            |            |           |           |
| 28     | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |           | 4          |           |            |            |           |           |
| 29     | Eldorado Cr. (M)  | 16 Jun 84   | 06-04 |           |            |           |            |            |           |           |
| 30     | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |           |            |           |            |            |           |           |
| 31     | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |           |            |           |            |            |           |           |
| 32     | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |           |            |           |            |            |           |           |
| 33     | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |           |            |           |            |            |           |           |
| 34     | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |           |            |           |            |            |           |           |
| 35     | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |           |            |           |            |            |           |           |
| 36     | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |           |            |           |            |            |           |           |
| 37     | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |           |            |           |            |            | 1         |           |
| 38     | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |           |            |           |            |            |           | 1         |
| 39     | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |           |            | 1         |            |            |           |           |
| 40     | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |           |            |           |            |            |           |           |
| 41     | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |           | 1          |           |            |            |           |           |
| 42     | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 |           | 1          |           |            |            |           |           |
| 43     | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |           |            |           |            |            |           |           |
| 44     | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |           |            |           |            |            |           |           |
| 45     | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |           |            | 1         |            |            |           |           |
| 46     | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |           |            |           |            |            |           |           |
| 47     | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |           |            |           |            |            |           |           |
| 48     | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 |           | 2          |           |            |            |           |           |
| 49     | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |           |            |           |            |            |           |           |
| 50     | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |           | 1          |           |            |            |           |           |
| 51     | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |           | 1          |           |            |            |           |           |
| 52     | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |           |            |           |            |            |           |           |
| 53     | Slate Cr. (M)     | 16 Jun 84   | 01-05 |           |            |           |            |            |           |           |
| 54     | Slate Cr. (M)     | 16 Jun 84   | 25-05 |           |            |           |            |            |           |           |
| 55     | Slate Cr. (M)     | 16 Jun 84   | 20-02 |           |            |           |            |            |           |           |
| 56     | Slate Cr. (M)     | 16 Jun 84   | 23-02 |           |            |           |            |            |           |           |
| 57     | Slate Cr. (M)     | 30 Jun 84   | 22-03 |           |            |           |            |            |           |           |
| 58     | Slate Cr. (M)     | 30 Jun 84   | 25-01 |           |            |           |            |            |           |           |
| 59     | Slate Cr. (M)     | 30 Jun 84   | 02-03 |           |            |           |            |            |           |           |
| 60     | Slate Cr. (M)     | 30 Jun 84   | 14-02 |           |            |           |            |            |           |           |
| 61     | Slate Cr. (M)     | 23 Jul 84   | 09-01 |           |            |           |            |            |           |           |
| 62     | Slate Cr. (M)     | 23 Jul 84   | 28-02 |           |            | 1         |            |            |           |           |
| 63     | Slate Cr. (M)     | 23 Jul 84   | 05-04 |           |            |           |            |            |           |           |
| 64     | Slate Cr. (M)     | 23 Jul 84   | 11-00 |           |            |           |            |            |           |           |
| 65     | Slate Cr. (M)     | 12 Aug 84   | 22-02 |           |            |           |            |            |           |           |
| 66     | Slate Cr. (M)     | 12 Aug 84   | 24-03 |           |            |           |            |            |           |           |
| 67     | Slate Cr. (M)     | 12 Aug 84   | 19-05 |           | 1          |           |            |            |           |           |
| 68     | Slate Cr. (M)     | 12 Aug 84   | 01-01 |           |            |           |            |            |           |           |
| 69     | Slate Cr. (M)     | 2 Sep 84    | 16-03 |           |            |           |            |            |           |           |
| 70     | Slate Cr. (M)     | 2 Sep 84    | 07-02 |           |            | 1         |            |            |           |           |
| 71     | Slate Cr. (M)     | 2 Sep 84    | 14-05 |           |            |           |            |            |           |           |
| 72     | Slate Cr. (M)     | 2 Sep 84    | 09-02 |           |            |           |            |            |           |           |
| 73     | Slate Cr. (M)     | 16 Sep 84   | 10-02 |           |            |           |            |            |           | 1         |
| 74     | Slate Cr. (M)     | 16 Sep 84   | 03-03 |           |            |           |            |            |           |           |
| 75     | Slate Cr. (M)     | 16 Sep 84   | 24-04 |           |            |           |            |            |           |           |
| 76     | Slate Cr. (M)     | 16 Sep 84   | 23-02 |           |            |           |            |            |           |           |
| 77     | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |           |            |           |            |            |           |           |
| 78     | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |           |            |           |            |            |           |           |
| 79     | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |           |            |           |            |            |           |           |
| 80     | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |           |            |           |            |            |           |           |
| 81     | Stampede Cr. (UM) | 1 Jul 84    | 06-00 |           |            |           |            |            |           |           |
| 82     | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |           |            |           |            |            |           |           |
| 83     | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |           |            |           |            |            |           |           |
| 84     | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |           |            |           |            |            |           | 2         |
| 85     | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |           |            |           |            |            |           |           |
| 86     | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |           |            |           |            |            |           |           |
| 87     | Stampede Cr. (UM) | 22 Jul 84   | 05-00 |           |            |           |            |            |           |           |
| 88     | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |           |            | 1         |            |            |           | 2         |
| 89     | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |           | 2          |           |            |            |           |           |
| 90     | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |           |            |           |            |            |           |           |
| 91     | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |           | 2          |           |            |            |           | 2         |
| 92     | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |           |            |           |            |            |           |           |
| 93     | Stampede Cr. (UM) | 1 Sep 84    | 17-04 |           | 2          |           |            |            |           |           |
| 94     | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |           |            | 1         |            |            |           |           |
| 95     | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |           |            |           |            |            |           | 2         |
| 96     | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |           |            |           |            |            |           |           |
| 97     | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |           |            |           |            |            |           | 2         |
| 98     | Stampede Cr. (UM) | 15 Sep 84   | 13-04 |           |            |           |            |            |           |           |



| 1   | 2                | 3         | 4          | 26        | 27        | 28        | 29         | 30         | 31        | 32        |
|-----|------------------|-----------|------------|-----------|-----------|-----------|------------|------------|-----------|-----------|
| 1   | STREAM           | DATE      | SAMPLE LOC | Diptera   | Diptera   | Diptera   | Diptera    | Diptera    | Diptera   | Diptera   |
| 2   |                  |           |            | Tipulidae | Tipulidae | Tipulidae | Tipulidae  | Tipulidae  | Tipulidae | Tipulidae |
| 3   |                  |           |            | Dicranota | Gonomyza  | Hexatoma  | Molophilus | Oreogaster | Pedicia   | Tipula    |
| 4   |                  |           |            |           |           |           |            |            |           |           |
| 99  | Stampede Cr.(UM) | 15 Sep 84 | 30-03      |           |           |           |            |            |           | 1         |
| 100 | Stampede Cr.(UM) | 15 Sep 84 | 24-01      |           |           |           |            |            |           |           |
| 101 | Stampede Cr.(M)  | 17 Jun 84 | 08-00      |           | 1         |           |            |            |           |           |
| 102 | Stampede Cr.(M)  | 17 Jun 84 | 22-00      |           | 1         |           |            |            |           | 3         |
| 103 | Stampede Cr.(M)  | 17 Jun 84 | 03-04      |           |           |           |            |            |           |           |
| 104 | Stampede Cr.(M)  | 17 Jun 84 | 00-03      |           |           |           |            |            |           |           |
| 105 | Stampede Cr.(M)  | 1 Jul 84  | 21-01      |           |           |           |            |            |           |           |
| 106 | Stampede Cr.(M)  | 1 Jul 84  | 00-02      |           |           |           |            |            |           |           |
| 107 | Stampede Cr.(M)  | 1 Jul 84  | 26-03      |           |           |           |            |            |           | 1         |
| 108 | Stampede Cr.(M)  | 1 Jul 84  | 06-04      |           |           |           |            |            |           |           |
| 109 | Stampede Cr.(M)  | 22 Jul 84 | 25-04      |           |           | 9         |            |            |           |           |
| 110 | Stampede Cr.(M)  | 22 Jul 84 | 23-03      |           |           | 6         |            |            |           |           |
| 111 | Stampede Cr.(M)  | 22 Jul 84 | 21-05      |           |           |           |            |            |           |           |
| 112 | Stampede Cr.(M)  | 22 Jul 84 | 13-02      |           |           |           |            |            |           |           |
| 113 | Stampede Cr.(M)  | 11 Aug 84 | 30-03      |           |           |           |            |            |           |           |
| 114 | Stampede Cr.(M)  | 11 Aug 84 | 02-04      |           | 3         |           |            |            |           | 1         |
| 115 | Stampede Cr.(M)  | 11 Aug 84 | 29-02      |           | 3         | 2         |            |            |           |           |
| 116 | Stampede Cr.(M)  | 11 Aug 84 | 22-03      |           |           |           |            |            |           |           |
| 117 | Stampede Cr.(M)  | 1 Sep 84  | 19-02      |           | 2         | 5         |            |            |           | 1         |
| 118 | Stampede Cr.(M)  | 1 Sep 84  | 21-04      |           |           |           |            |            |           |           |
| 119 | Stampede Cr.(M)  | 1 Sep 84  | 12-02      |           |           |           |            |            |           |           |
| 120 | Stampede Cr.(M)  | 1 Sep 84  | 19-06      |           |           | 6         |            |            |           | 4         |
| 121 | Stampede Cr.(M)  | 15 Sep 84 | 19-03      |           |           | 3         |            |            |           |           |
| 122 | Stampede Cr.(M)  | 15 Sep 84 | 21-02      |           |           |           |            |            |           |           |
| 123 | Stampede Cr.(M)  | 15 Sep 84 | 13-04      |           |           | 3         |            |            |           |           |
| 124 | Stampede Cr.(M)  | 15 Sep 84 | 03-03      |           | 1         |           |            |            |           | 2         |
| 125 | Jumbo Cr.(UM)    | 18 Jun 84 | 05-06      |           |           |           |            |            |           |           |
| 126 | Jumbo Cr.(UM)    | 18 Jun 84 | 07-08      |           |           |           |            |            |           |           |
| 127 | Jumbo Cr.(UM)    | 18 Jun 84 | 03-01      |           |           |           |            |            |           |           |
| 128 | Jumbo Cr.(UM)    | 18 Jun 84 | 02-21      |           | 1         |           |            |            |           |           |
| 129 | Jumbo Cr.(UM)    | 2 Jul 84  | 27-04      |           |           |           |            |            |           |           |
| 130 | Jumbo Cr.(UM)    | 2 Jul 84  | 06-02      |           |           |           |            |            |           |           |
| 131 | Jumbo Cr.(UM)    | 2 Jul 84  | 30-05      |           |           |           |            |            |           |           |
| 132 | Jumbo Cr.(UM)    | 2 Jul 84  | 20-07      |           |           |           |            | 1          |           |           |
| 133 | Jumbo Cr.(UM)    | 21 Jul 84 | 29-03      |           |           |           |            |            |           |           |
| 134 | Jumbo Cr.(UM)    | 21 Jul 84 | 12-06      |           |           |           |            |            |           |           |
| 135 | Jumbo Cr.(UM)    | 21 Jul 84 | 09-02      |           |           |           |            |            |           |           |
| 136 | Jumbo Cr.(UM)    | 21 Jul 84 | 24-04      |           |           |           |            |            |           | 1         |
| 137 | Jumbo Cr.(UM)    | 13 Aug 84 | 11-03      |           |           |           |            |            |           |           |
| 138 | Jumbo Cr.(UM)    | 13 Aug 84 | 08-03      |           |           |           |            |            |           |           |
| 139 | Jumbo Cr.(UM)    | 13 Aug 84 | 04-03      |           | 4         |           |            |            |           |           |
| 140 | Jumbo Cr.(UM)    | 13 Aug 84 | 09-05      |           |           |           |            |            |           |           |
| 141 | Jumbo Cr.(UM)    | 3 Sep 84  | 14-03      |           |           |           |            |            |           |           |
| 142 | Jumbo Cr.(UM)    | 3 Sep 84  | 28-05      |           |           |           |            |            |           |           |
| 143 | Jumbo Cr.(UM)    | 3 Sep 84  | 11-13      |           |           |           |            |            |           |           |
| 144 | Jumbo Cr.(UM)    | 3 Sep 84  | 25-06      |           |           |           |            |            |           |           |
| 145 | Jumbo Cr.(UM)    | 17 Sep 84 | 06-04      |           | 1         |           |            |            |           |           |
| 146 | Jumbo Cr.(UM)    | 17 Sep 84 | 12-03      |           |           |           |            |            |           |           |
| 147 | Jumbo Cr.(UM)    | 17 Sep 84 | 07-10      |           |           |           |            |            |           |           |
| 148 | Jumbo Cr.(UM)    | 17 Sep 84 | 15-08      |           |           |           |            |            |           |           |
| 149 |                  |           |            |           |           |           |            |            |           |           |
| 150 | GRAND TOTAL      |           |            | 139       | 39        | 1         | 8          | 1          | 2         | 28        |
| 151 | ELDOCOUNT        |           |            | 14        | 0         | 0         | 5          | 0          | 1         | 2         |
| 152 | ELD(M)COUNT      |           |            | 5         | 1         | 1         | 0          | 0          | 1         | 1         |
| 153 | SLATE(M) COUNT   |           |            | 1         | 2         | 0         | 0          | 0          | 0         | 1         |
| 154 | STAMPEDE COUNT   |           |            | 3         | 2         | 0         | 0          | 0          | 0         | 6         |
| 155 | STAMPI(M) COUNT  |           |            | 6         | 7         | 0         | 0          | 0          | 0         | 6         |
| 156 | JUMBO COUNT      |           |            | 3         | 0         | 0         | 0          | 1          | 0         | 1         |

| 1      | 2                 | 3           | 4     | 33           | 34           | 35           | 36            | 37            | 38            | 39            |
|--------|-------------------|-------------|-------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|
| STREAM | DATE              | SAMPLE LOC. |       | Diptera      | Diptera      | Diptera      | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera |
|        |                   |             |       | Tipulidae    | pupae        | unidentified | Beetles       | Beetles       | Ephemeralidae | Ephemeralidae |
|        |                   |             |       | unidentified | unidentified |              | Beetles       | unidentified  | Drunella      | unidentified  |
| 5      | Eldorado Cr. (UM) | 16 Jun 84   | 26-04 |              |              | 8            | 64            | 40            |               |               |
| 6      | Eldorado Cr. (UM) | 16 Jun 84   | 02-02 |              |              |              | 6             | 32            |               |               |
| 7      | Eldorado Cr. (UM) | 16 Jun 84   | 06-04 |              | 8            |              | 32            |               |               |               |
| 8      | Eldorado Cr. (UM) | 16 Jun 84   | 04-05 |              |              |              | 29            |               |               |               |
| 9      | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |              | 153          |              | 8             | 16            |               |               |
| 10     | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |              | 23           |              | 183           |               |               |               |
| 11     | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |              |              |              | 5             | 11            |               |               |
| 12     | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 |              |              |              | 38            | 1             |               |               |
| 13     | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |              |              |              | 3             | 4             |               |               |
| 14     | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |              | 66           |              | 4             | 156           |               |               |
| 15     | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 |              |              |              | 23            | 363           |               |               |
| 16     | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 |              | 85           |              |               | 266           |               |               |
| 17     | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |              |              |              | 12            | 441           |               |               |
| 18     | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |              |              |              |               | 517           |               |               |
| 19     | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 |              |              |              | 6             | 378           |               |               |
| 20     | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |              | 11           | 1            | 10            | 406           |               |               |
| 21     | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |              |              |              |               | 451           |               |               |
| 22     | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 |              | 4            |              |               | 306           |               |               |
| 23     | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |              |              | 1            | 10            | 384           |               |               |
| 24     | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |              |              |              | 2             | 185           |               |               |
| 25     | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |              | 2            |              | 5             |               |               |               |
| 26     | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |              |              |              | 193           |               |               |               |
| 27     | Eldorado Cr. (UM) | 16 Sep 84   | 06-02 |              | 2            | 1            |               | 85            |               |               |
| 28     | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |              |              |              |               | 158           |               |               |
| 29     | Eldorado Cr. (M)  | 16 Jun 84   | 06-04 |              |              |              | 5             | 6             |               |               |
| 30     | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |              |              |              |               | 3             |               |               |
| 31     | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |              | 1            |              | 1             |               |               |               |
| 32     | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |              |              |              |               |               |               |               |
| 33     | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |              | 1            | 3            | 8             |               |               |               |
| 34     | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |              |              |              | 12            |               |               |               |
| 35     | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |              |              |              | 5             |               |               |               |
| 36     | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |              |              | 1            | 2             |               |               |               |
| 37     | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |              |              | 1            | 9             | 4             |               |               |
| 38     | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |              |              | 3            | 16            | 8             |               |               |
| 39     | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |              |              |              | 4             | 2             |               |               |
| 40     | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |              | 1            |              | 2             | 3             |               |               |
| 41     | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |              |              |              |               | 2             |               |               |
| 42     | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 |              |              |              | 2             |               |               |               |
| 43     | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |              |              |              | 3             |               |               |               |
| 44     | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |              |              |              |               | 6             |               |               |
| 45     | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |              |              |              |               | 38            |               |               |
| 46     | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |              |              |              |               | 12            |               |               |
| 47     | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |              |              |              | 42            |               |               |               |
| 48     | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 |              |              |              | 1             | 44            |               |               |
| 49     | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |              |              |              |               | 64            |               |               |
| 50     | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |              |              |              | 1             | 101           |               |               |
| 51     | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |              |              | 1            |               | 52            |               |               |
| 52     | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |              |              |              |               | 18            |               |               |
| 53     | Slate Cr. (M)     | 16 Jun 84   | 01-05 |              |              | 1            | 2             | 2             |               |               |
| 54     | Slate Cr. (M)     | 16 Jun 84   | 25-05 |              |              |              | 6             |               |               |               |
| 55     | Slate Cr. (M)     | 16 Jun 84   | 20-02 |              |              |              |               | 1             |               |               |
| 56     | Slate Cr. (M)     | 16 Jun 84   | 23-02 |              |              |              | 6             |               |               |               |
| 57     | Slate Cr. (M)     | 30 Jun 84   | 22-03 |              |              |              | 4             |               |               |               |
| 58     | Slate Cr. (M)     | 30 Jun 84   | 25-01 |              |              |              | 10            | 1             |               |               |
| 59     | Slate Cr. (M)     | 30 Jun 84   | 02-03 |              |              | 2            | 6             |               |               |               |
| 60     | Slate Cr. (M)     | 30 Jun 84   | 14-02 |              |              |              | 7             |               |               |               |
| 61     | Slate Cr. (M)     | 23 Jul 84   | 09-01 |              |              |              | 1             |               |               |               |
| 62     | Slate Cr. (M)     | 23 Jul 84   | 28-02 |              | 2            | 8            |               |               |               |               |
| 63     | Slate Cr. (M)     | 23 Jul 84   | 05-04 |              |              | 6            | 11            |               |               |               |
| 64     | Slate Cr. (M)     | 23 Jul 84   | 11-00 |              |              |              |               |               |               |               |
| 65     | Slate Cr. (M)     | 12 Aug 84   | 22-02 |              |              | 1            |               |               |               |               |
| 66     | Slate Cr. (M)     | 12 Aug 84   | 24-03 |              |              | 2            |               |               |               |               |
| 67     | Slate Cr. (M)     | 12 Aug 84   | 19-05 |              |              | 5            | 3             |               |               |               |
| 68     | Slate Cr. (M)     | 12 Aug 84   | 01-01 |              |              | 3            |               |               |               |               |
| 69     | Slate Cr. (M)     | 2 Sep 84    | 16-03 |              |              | 4            |               |               |               |               |
| 70     | Slate Cr. (M)     | 2 Sep 84    | 07-02 |              |              | 1            |               |               |               |               |
| 71     | Slate Cr. (M)     | 2 Sep 84    | 14-05 |              |              |              |               | 5             |               |               |
| 72     | Slate Cr. (M)     | 2 Sep 84    | 09-02 |              |              |              |               |               |               |               |
| 73     | Slate Cr. (M)     | 16 Sep 84   | 10-02 |              |              |              |               | 51            |               |               |
| 74     | Slate Cr. (M)     | 16 Sep 84   | 03-03 |              |              |              | 33            |               |               |               |
| 75     | Slate Cr. (M)     | 16 Sep 84   | 24-04 |              |              |              |               | 33            |               |               |
| 76     | Slate Cr. (M)     | 16 Sep 84   | 23-02 |              |              |              |               | 31            |               |               |
| 77     | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |              |              |              |               |               |               |               |
| 78     | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |              |              |              |               |               |               |               |
| 79     | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |              |              |              |               |               |               |               |
| 80     | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |              |              |              |               |               |               |               |
| 81     | Stampede Cr. (UM) | 1 Jul 84    | 06-00 |              |              |              | 1             |               |               |               |
| 82     | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |              |              |              | 3             | 3             |               |               |
| 83     | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |              |              |              |               |               |               |               |
| 84     | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |              |              | 2            | 4             |               |               |               |
| 85     | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |              |              |              |               |               |               |               |
| 86     | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |              |              |              | 1             |               |               |               |
| 87     | Stampede Cr. (UM) | 22 Jul 84   | 05-00 |              |              |              |               |               |               |               |
| 88     | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |              |              |              |               |               |               |               |
| 89     | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |              | 1            |              | 2             |               |               |               |
| 90     | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |              |              |              |               | 7             |               |               |
| 91     | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |              |              |              | 6             | 4             |               |               |
| 92     | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |              |              |              | 5             |               |               |               |
| 93     | Stampede Cr. (UM) | 1 Sep 84    | 17-04 |              |              |              | 1             |               |               |               |
| 94     | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |              | 3            |              |               | 1             |               |               |
| 95     | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |              |              | 1            |               |               |               |               |
| 96     | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |              |              |              |               |               |               |               |
| 97     | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |              |              | 1            |               |               |               |               |
| 98     | Stampede Cr. (UM) | 15 Sep 84   | 13-04 |              |              | 2            |               |               |               |               |

| 1   | 2                | 3         | 4           | 33           | 34           | 35           | 36            | 37            | 38            | 39            |
|-----|------------------|-----------|-------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|
| 1   | STREAM           | DATE      | SAMPLE LOC. | Diptera      | Diptera      | Diptera      | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera |
| 2   |                  |           |             | Tipulidae    | pupae        | unidentified | Beetles       | Beetles       | Ephemeroptera | Ephemeroptera |
| 3   |                  |           |             | unidentified | unidentified |              | Beetles       | unidentified  | Drumella      | unidentified  |
| 4   |                  |           |             |              |              |              |               |               |               |               |
| 99  | Stampede Cr (UM) | 15 Sep 84 | 30-03       |              | 1            |              | 1             |               |               |               |
| 100 | Stampede Cr (UM) | 15 Sep 84 | 24-01       |              |              |              |               |               |               |               |
| 101 | Stampede Cr (M)  | 17 Jun 84 | 08-00       |              |              |              |               |               |               |               |
| 102 | Stampede Cr (M)  | 17 Jun 84 | 22-00       |              |              |              |               |               |               |               |
| 103 | Stampede Cr (M)  | 17 Jun 84 | 03-04       |              | 1            |              |               |               |               |               |
| 104 | Stampede Cr (M)  | 17 Jun 84 | 00-03       |              |              |              |               |               |               |               |
| 105 | Stampede Cr (M)  | 1 Jul 84  | 21-01       |              |              |              |               |               |               |               |
| 106 | Stampede Cr (M)  | 1 Jul 84  | 00-02       |              |              |              |               |               |               |               |
| 107 | Stampede Cr (M)  | 1 Jul 84  | 26-03       |              |              |              |               |               |               |               |
| 108 | Stampede Cr (M)  | 1 Jul 84  | 06-04       |              |              |              |               |               |               |               |
| 109 | Stampede Cr (M)  | 22 Jul 84 | 25-04       |              | 1            |              | 1             |               |               |               |
| 110 | Stampede Cr (M)  | 22 Jul 84 | 23-03       |              |              |              |               |               |               |               |
| 111 | Stampede Cr (M)  | 22 Jul 84 | 21-05       |              |              |              |               |               |               |               |
| 112 | Stampede Cr (M)  | 22 Jul 84 | 13-02       |              |              |              |               |               |               |               |
| 113 | Stampede Cr (M)  | 11 Aug 84 | 30-03       |              |              |              |               | 4             |               |               |
| 114 | Stampede Cr (M)  | 11 Aug 84 | 02-04       |              |              |              | 12            |               |               |               |
| 115 | Stampede Cr (M)  | 11 Aug 84 | 29-02       |              |              |              | 1             |               |               |               |
| 116 | Stampede Cr (M)  | 11 Aug 84 | 22-03       |              | 1            |              |               | 4             |               |               |
| 117 | Stampede Cr (M)  | 1 Sep 84  | 19-02       |              | 2            |              |               |               |               |               |
| 118 | Stampede Cr (M)  | 1 Sep 84  | 21-04       |              |              |              |               |               |               |               |
| 119 | Stampede Cr (M)  | 1 Sep 84  | 12-02       | 1            |              |              | 1             |               |               |               |
| 120 | Stampede Cr (M)  | 1 Sep 84  | 18-06       |              | 2            |              |               |               |               |               |
| 121 | Stampede Cr (M)  | 15 Sep 84 | 19-03       | 2            | 10           | 2            |               |               |               |               |
| 122 | Stampede Cr (M)  | 15 Sep 84 | 21-02       |              |              |              |               |               |               |               |
| 123 | Stampede Cr (M)  | 15 Sep 84 | 13-04       |              | 1            |              |               |               |               |               |
| 124 | Stampede Cr (M)  | 15 Sep 84 | 03-03       |              | 9            |              |               |               |               |               |
| 125 | Jumbo Cr (UM)    | 18 Jun 84 | 05-06       |              |              |              | 58            | 8             |               |               |
| 126 | Jumbo Cr (UM)    | 18 Jun 84 | 07-08       |              |              |              | 582           |               | 2             |               |
| 127 | Jumbo Cr (UM)    | 18 Jun 84 | 03-01       |              |              |              | 101           |               |               |               |
| 128 | Jumbo Cr (UM)    | 18 Jun 84 | 02-21       |              | 12           |              | 113           | 242           |               |               |
| 129 | Jumbo Cr (UM)    | 2 Jul 84  | 27-04       |              |              |              | 31            | 9             |               |               |
| 130 | Jumbo Cr (UM)    | 2 Jul 84  | 06-02       |              |              |              | 211           |               |               |               |
| 131 | Jumbo Cr (UM)    | 2 Jul 84  | 30-05       |              | 14           |              | 52            |               |               |               |
| 132 | Jumbo Cr (UM)    | 2 Jul 84  | 20-07       |              |              |              |               | 89            |               |               |
| 133 | Jumbo Cr (UM)    | 21 Jul 84 | 29-03       |              |              |              | 91            |               |               |               |
| 134 | Jumbo Cr (UM)    | 21 Jul 84 | 12-06       |              |              |              | 58            |               |               | 3             |
| 135 | Jumbo Cr (UM)    | 21 Jul 84 | 09-02       |              | 1            |              | 104           |               |               |               |
| 136 | Jumbo Cr (UM)    | 21 Jul 84 | 24-04       |              | 100          |              | 56            |               |               |               |
| 137 | Jumbo Cr (UM)    | 13 Aug 84 | 11-03       |              | 12           |              | 14            | 17            |               |               |
| 138 | Jumbo Cr (UM)    | 13 Aug 84 | 08-03       |              |              |              | 4             |               |               |               |
| 139 | Jumbo Cr (UM)    | 13 Aug 84 | 04-03       |              |              |              | 40            |               |               | 12            |
| 140 | Jumbo Cr (UM)    | 13 Aug 84 | 09-05       |              |              |              | 54            | 12            |               | 11            |
| 141 | Jumbo Cr (UM)    | 3 Sep 84  | 14-03       |              |              |              | 5             |               | 1             |               |
| 142 | Jumbo Cr (UM)    | 3 Sep 84  | 28-05       |              | 21           |              | 15            |               | 25            |               |
| 143 | Jumbo Cr (UM)    | 3 Sep 84  | 11-13       |              | 1            | 1            | 6             | 11            | 20            |               |
| 144 | Jumbo Cr (UM)    | 3 Sep 84  | 25-06       |              | 12           |              | 6             |               |               | 4             |
| 145 | Jumbo Cr (UM)    | 17 Sep 84 | 06-04       |              | 8            |              | 8             |               | 12            |               |
| 146 | Jumbo Cr (UM)    | 17 Sep 84 | 12-03       |              |              |              | 2             |               | 13            |               |
| 147 | Jumbo Cr (UM)    | 17 Sep 84 | 07-10       |              | 3            |              | 1             |               |               |               |
| 148 | Jumbo Cr (UM)    | 17 Sep 84 | 15-08       |              |              |              |               |               | 3             |               |
| 149 |                  |           |             |              |              |              |               |               |               |               |
| 150 | GRAND TOTAL      |           |             | 16           | 617          | 8            | 2585          | 5146          | 76            | 30            |
| 151 | ELDCOUNT         |           |             | 2            | 9            | 2            | 18            | 19            | 0             | 0             |
| 152 | ELDXICOUNT       |           |             | 2            | 5            | 1            | 15            | 15            | 0             | 0             |
| 153 | SLATE(M) COUNT   |           |             | 1            | 10           | 0            | 11            | 9             | 0             | 0             |
| 154 | STAMPEDE COUNT   |           |             | 3            | 3            | 2            | 8             | 4             | 0             | 0             |
| 155 | STAMP(M) COUNT   |           |             | 2            | 8            | 1            | 4             | 2             | 0             | 0             |
| 156 | JUMBO COUNT      |           |             | 0            | 10           | 1            | 22            | 7             | 7             | 4             |



| 1      | 2                 | 3          | 4     | 40            | 41            | 42            | 43            | 44            | 45            | 46            |
|--------|-------------------|------------|-------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| STREAM | DATE              | SAMPLE LOC |       | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera |
|        |                   |            |       | Heptageniidae | Heptageniidae | Heptageniidae | Heptageniidae | Siphonuridae  | Siphonuridae  | Heptageniidae |
|        |                   |            |       | Cinygmula     | Epeorus       | Rithrogena    | unidentified  | Amelanus      | unidentified  | unidentified  |
| 5      | Eldorado Cr. (UM) | 16 Jun 84  | 26-04 | 4             |               |               |               |               |               | 2             |
| 6      | Eldorado Cr. (UM) | 16 Jun 84  | 02-02 | 6             |               |               |               | 9             |               |               |
| 7      | Eldorado Cr. (UM) | 16 Jun 84  | 06-04 | 3             | 3             |               |               | 42            |               |               |
| 8      | Eldorado Cr. (UM) | 16 Jun 84  | 04-05 |               | 3             |               |               | 6             |               |               |
| 9      | Eldorado Cr. (UM) | 30 Jun 84  | 13-04 |               |               |               |               | 4             |               |               |
| 10     | Eldorado Cr. (UM) | 30 Jun 84  | 08-04 | 20            |               |               |               | 12            |               |               |
| 11     | Eldorado Cr. (UM) | 30 Jun 84  | 01-00 | 3             |               |               |               | 114           |               |               |
| 12     | Eldorado Cr. (UM) | 30 Jun 84  | 20-03 | 1             |               |               |               | 1             |               |               |
| 13     | Eldorado Cr. (UM) | 23 Jul 84  | 30-09 | 4             | 2             |               |               | 59            |               |               |
| 14     | Eldorado Cr. (UM) | 23 Jul 84  | 24-02 |               |               |               |               |               |               |               |
| 15     | Eldorado Cr. (UM) | 23 Jul 84  | 05-04 | 2             |               |               |               | 179           |               |               |
| 16     | Eldorado Cr. (UM) | 23 Jul 84  | 18-04 | 9             |               |               |               | 27            |               |               |
| 17     | Eldorado Cr. (UM) | 12 Aug 84  | 12-01 | 2             |               |               |               | 1             | 3             |               |
| 18     | Eldorado Cr. (UM) | 12 Aug 84  | 14-03 |               |               |               |               | 1             | 1             |               |
| 19     | Eldorado Cr. (UM) | 12 Aug 84  | 26-02 | 10            |               |               |               | 5             | 3             |               |
| 20     | Eldorado Cr. (UM) | 12 Aug 84  | 08-03 | 9             | 1             |               |               | 7             |               |               |
| 21     | Eldorado Cr. (UM) | 2 Sep 84   | 03-02 | 22            |               |               |               | 38            |               |               |
| 22     | Eldorado Cr. (UM) | 2 Sep 84   | 29-03 |               | 1             |               | 7             | 37            | 10            |               |
| 23     | Eldorado Cr. (UM) | 2 Sep 84   | 21-01 | 55            |               |               | 1             | 8             | 9             |               |
| 24     | Eldorado Cr. (UM) | 2 Sep 84   | 08-02 | 8             |               |               | 2             | 53            | 13            |               |
| 25     | Eldorado Cr. (UM) | 16 Sep 84  | 19-07 | 1             |               |               |               | 23            |               |               |
| 26     | Eldorado Cr. (UM) | 16 Sep 84  | 11-09 |               |               |               |               | 8             |               |               |
| 27     | Eldorado Cr. (UM) | 16 Sep 84  | 06-02 | 11            | 3             |               |               | 104           |               |               |
| 28     | Eldorado Cr. (UM) | 16 Sep 84  | 02-02 | 19            | 12            |               |               | 88            |               |               |
| 29     | Eldorado Cr. (M)  | 16 Jun 84  | 06-04 |               |               |               |               | 1             |               |               |
| 30     | Eldorado Cr. (M)  | 16 Jun 84  | 12-04 |               |               |               |               |               |               |               |
| 31     | Eldorado Cr. (M)  | 16 Jun 84  | 15-01 | 1             |               |               |               | 3             |               |               |
| 32     | Eldorado Cr. (M)  | 16 Jun 84  | 23-01 | 1             |               |               |               |               |               |               |
| 33     | Eldorado Cr. (M)  | 30 Jun 84  | 23-03 | 1             |               |               |               |               |               |               |
| 34     | Eldorado Cr. (M)  | 30 Jun 84  | 00-02 |               |               |               |               | 3             |               |               |
| 35     | Eldorado Cr. (M)  | 30 Jun 84  | 18-02 |               |               |               |               |               |               |               |
| 36     | Eldorado Cr. (M)  | 30 Jun 84  | 05-04 |               |               |               |               |               |               |               |
| 37     | Eldorado Cr. (M)  | 23 Jul 84  | 01-02 | 4             | 3             |               |               |               |               |               |
| 38     | Eldorado Cr. (M)  | 23 Jul 84  | 02-04 | 5             | 4             |               |               | 10            |               |               |
| 39     | Eldorado Cr. (M)  | 23 Jul 84  | 27-01 | 2             | 1             |               |               |               |               |               |
| 40     | Eldorado Cr. (M)  | 23 Jul 84  | 01-04 | 2             |               |               |               |               |               |               |
| 41     | Eldorado Cr. (M)  | 12 Aug 84  | 07-04 |               |               |               |               |               |               |               |
| 42     | Eldorado Cr. (M)  | 12 Aug 84  | 13-01 |               |               |               |               | 3             |               |               |
| 43     | Eldorado Cr. (M)  | 12 Aug 84  | 26-03 |               |               |               |               |               |               |               |
| 44     | Eldorado Cr. (M)  | 12 Aug 84  | 10-01 | 1             |               |               |               | 3             |               |               |
| 45     | Eldorado Cr. (M)  | 2 Sep 84   | 02-02 |               |               |               | 3             |               |               |               |
| 46     | Eldorado Cr. (M)  | 2 Sep 84   | 08-03 | 1             |               |               |               |               |               |               |
| 47     | Eldorado Cr. (M)  | 2 Sep 84   | 01-05 |               |               |               |               | 2             |               |               |
| 48     | Eldorado Cr. (M)  | 2 Sep 84   | 13-02 | 2             |               |               |               | 1             |               |               |
| 49     | Eldorado Cr. (M)  | 16 Sep 84  | 09-04 | 5             |               |               |               |               |               |               |
| 50     | Eldorado Cr. (M)  | 16 Sep 84  | 18-02 | 3             |               |               |               |               |               |               |
| 51     | Eldorado Cr. (M)  | 16 Sep 84  | 14-03 | 2             | 1             |               |               |               | 1             |               |
| 52     | Eldorado Cr. (M)  | 16 Sep 84  | 17-04 |               |               |               |               |               |               |               |
| 53     | Slate Cr. (M)     | 16 Jun 84  | 01-05 |               |               |               |               |               |               |               |
| 54     | Slate Cr. (M)     | 16 Jun 84  | 25-05 | 1             |               |               |               |               |               |               |
| 55     | Slate Cr. (M)     | 16 Jun 84  | 20-02 |               |               |               |               |               |               |               |
| 56     | Slate Cr. (M)     | 16 Jun 84  | 23-02 |               |               |               |               | 1             |               |               |
| 57     | Slate Cr. (M)     | 30 Jun 84  | 22-03 |               |               |               |               |               |               |               |
| 58     | Slate Cr. (M)     | 30 Jun 84  | 25-01 |               |               |               |               |               |               |               |
| 59     | Slate Cr. (M)     | 30 Jun 84  | 02-03 |               |               |               |               |               |               |               |
| 60     | Slate Cr. (M)     | 30 Jun 84  | 14-02 |               |               |               |               |               |               |               |
| 61     | Slate Cr. (M)     | 23 Jul 84  | 09-01 |               |               |               |               |               |               |               |
| 62     | Slate Cr. (M)     | 23 Jul 84  | 28-02 |               |               |               |               |               |               |               |
| 63     | Slate Cr. (M)     | 23 Jul 84  | 05-04 |               |               |               |               |               |               |               |
| 64     | Slate Cr. (M)     | 23 Jul 84  | 11-00 |               |               |               |               |               |               |               |
| 65     | Slate Cr. (M)     | 12 Aug 84  | 22-02 |               |               |               |               |               |               |               |
| 66     | Slate Cr. (M)     | 12 Aug 84  | 24-03 |               |               |               |               |               |               |               |
| 67     | Slate Cr. (M)     | 12 Aug 84  | 19-05 |               |               |               |               |               |               |               |
| 68     | Slate Cr. (M)     | 12 Aug 84  | 01-01 |               |               |               |               |               |               |               |
| 69     | Slate Cr. (M)     | 2 Sep 84   | 16-03 |               |               |               |               | 5             |               |               |
| 70     | Slate Cr. (M)     | 2 Sep 84   | 07-02 |               |               |               |               |               |               |               |
| 71     | Slate Cr. (M)     | 2 Sep 84   | 14-05 |               |               |               |               | 1             |               |               |
| 72     | Slate Cr. (M)     | 2 Sep 84   | 09-02 |               |               |               |               |               |               |               |
| 73     | Slate Cr. (M)     | 16 Sep 84  | 10-02 | 1             |               |               |               | 1             |               |               |
| 74     | Slate Cr. (M)     | 16 Sep 84  | 03-03 | 2             |               |               |               |               |               |               |
| 75     | Slate Cr. (M)     | 16 Sep 84  | 24-04 | 3             |               |               |               | 2             |               |               |
| 76     | Slate Cr. (M)     | 16 Sep 84  | 23-02 |               |               |               |               |               |               |               |
| 77     | Stampede Cr. (UM) | 17 Jun 84  | 00-02 |               |               |               |               | 1             |               |               |
| 78     | Stampede Cr. (UM) | 17 Jun 84  | 09-00 |               |               |               |               |               |               |               |
| 79     | Stampede Cr. (UM) | 17 Jun 84  | 02-05 |               |               |               |               |               |               |               |
| 80     | Stampede Cr. (UM) | 17 Jun 84  | 06-02 |               |               |               |               |               |               |               |
| 81     | Stampede Cr. (UM) | 1 Jul 84   | 06-00 |               |               |               |               | 1             |               |               |
| 82     | Stampede Cr. (UM) | 1 Jul 84   | 08-03 |               |               |               |               | 5             |               |               |
| 83     | Stampede Cr. (UM) | 1 Jul 84   | 00-01 |               |               |               |               |               |               |               |
| 84     | Stampede Cr. (UM) | 1 Jul 84   | 29-04 |               |               |               |               |               |               |               |
| 85     | Stampede Cr. (UM) | 22 Jul 84  | 23-02 |               |               |               |               | 4             |               |               |
| 86     | Stampede Cr. (UM) | 22 Jul 84  | 00-04 |               |               |               |               | 5             |               |               |
| 87     | Stampede Cr. (UM) | 22 Jul 84  | 05-00 |               |               |               |               |               |               |               |
| 88     | Stampede Cr. (UM) | 22 Jul 84  | 30-00 |               |               |               |               |               |               |               |
| 89     | Stampede Cr. (UM) | 11 Aug 84  | 23-04 |               |               |               |               |               |               |               |
| 90     | Stampede Cr. (UM) | 11 Aug 84  | 22-01 |               |               |               |               | 2             |               |               |
| 91     | Stampede Cr. (UM) | 11 Aug 84  | 01-01 |               |               |               |               | 2             |               |               |
| 92     | Stampede Cr. (UM) | 11 Aug 84  | 02-04 |               |               |               |               |               |               |               |
| 93     | Stampede Cr. (UM) | 1 Sep 84   | 17-04 |               |               |               |               | 2             |               |               |
| 94     | Stampede Cr. (UM) | 1 Sep 84   | 28-04 |               |               |               |               | 9             |               |               |
| 95     | Stampede Cr. (UM) | 1 Sep 84   | 12-02 |               |               |               |               | 9             |               |               |
| 96     | Stampede Cr. (UM) | 1 Sep 84   | 22-03 |               |               |               |               |               |               |               |
| 97     | Stampede Cr. (UM) | 15 Sep 84  | 08-01 |               |               |               |               |               |               |               |
| 98     | Stampede Cr. (UM) | 15 Sep 84  | 13-04 |               |               |               |               | 18            |               |               |

| 1      | 2                | 3           | 4     | 40            | 41            | 42            | 43            | 44            | 45            | 46            |
|--------|------------------|-------------|-------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| STREAM | DATE             | SAMPLE LOC. |       | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera | Ephemeroptera |
|        |                  |             |       | Heptageniidae | Heptageniidae | Heptageniidae | Heptageniidae | Siphonuridae  | Siphonuridae  | unidentified  |
|        |                  |             |       | Cinygmula     | Epeorus       | Rithrogena    | unidentified  | Ameletus      | unidentified  |               |
| 99     | Stampede Cr.(UM) | 15 Sep 84   | 30-03 |               |               |               |               |               | 6             |               |
| 100    | Stampede Cr.(UM) | 15 Sep 84   | 24-01 |               |               |               |               |               | 7             |               |
| 101    | Stampede Cr.(M)  | 17 Jun 84   | 08-00 |               |               |               |               |               |               |               |
| 102    | Stampede Cr.(M)  | 17 Jun 84   | 22-00 |               |               |               |               |               |               |               |
| 103    | Stampede Cr.(M)  | 17 Jun 84   | 03-04 |               |               |               |               |               |               |               |
| 104    | Stampede Cr.(M)  | 17 Jun 84   | 00-03 |               |               |               |               |               |               |               |
| 105    | Stampede Cr.(M)  | 1 Jul 84    | 21-01 |               |               |               |               |               |               |               |
| 106    | Stampede Cr.(M)  | 1 Jul 84    | 00-02 |               |               |               |               |               |               |               |
| 107    | Stampede Cr.(M)  | 1 Jul 84    | 26-03 |               |               |               |               |               | 1             |               |
| 108    | Stampede Cr.(M)  | 1 Jul 84    | 06-04 |               |               |               |               |               |               |               |
| 109    | Stampede Cr.(M)  | 22 Jul 84   | 25-04 |               |               |               |               |               | 2             |               |
| 110    | Stampede Cr.(M)  | 22 Jul 84   | 23-03 |               |               |               |               |               |               |               |
| 111    | Stampede Cr.(M)  | 22 Jul 84   | 21-05 |               |               |               |               |               |               |               |
| 112    | Stampede Cr.(M)  | 22 Jul 84   | 13-02 |               |               |               |               |               | 1             |               |
| 113    | Stampede Cr.(M)  | 11 Aug 84   | 30-03 |               |               |               |               |               |               |               |
| 114    | Stampede Cr.(M)  | 11 Aug 84   | 02-04 |               |               |               |               |               | 2             |               |
| 115    | Stampede Cr.(M)  | 11 Aug 84   | 29-02 |               |               |               |               |               | 2             |               |
| 116    | Stampede Cr.(M)  | 11 Aug 84   | 22-03 |               |               |               |               |               |               |               |
| 117    | Stampede Cr.(M)  | 1 Sep 84    | 19-02 |               |               |               |               |               |               |               |
| 118    | Stampede Cr.(M)  | 1 Sep 84    | 21-04 |               |               |               |               |               |               |               |
| 119    | Stampede Cr.(M)  | 1 Sep 84    | 12-02 |               |               |               |               |               |               |               |
| 120    | Stampede Cr.(M)  | 1 Sep 84    | 18-06 |               |               |               |               |               | 9             |               |
| 121    | Stampede Cr.(M)  | 15 Sep 84   | 19-03 |               |               |               |               |               |               | 1             |
| 122    | Stampede Cr.(M)  | 15 Sep 84   | 21-02 |               |               |               |               |               |               |               |
| 123    | Stampede Cr.(M)  | 15 Sep 84   | 13-04 |               |               |               |               |               |               |               |
| 124    | Stampede Cr.(M)  | 15 Sep 84   | 03-03 |               |               |               |               |               |               |               |
| 125    | Jumbo Cr.(UM)    | 18 Jun 84   | 05-06 |               | 13            | 51            |               |               | 3             |               |
| 126    | Jumbo Cr.(UM)    | 18 Jun 84   | 07-08 |               | 36            | 213           |               |               | 32            |               |
| 127    | Jumbo Cr.(UM)    | 18 Jun 84   | 03-01 |               | 13            | 70            |               |               | 12            |               |
| 128    | Jumbo Cr.(UM)    | 18 Jun 84   | 02-21 |               | 50            | 408           |               |               | 24            |               |
| 129    | Jumbo Cr.(UM)    | 2 Jul 84    | 27-04 |               | 39            | 30            |               |               | 62            |               |
| 130    | Jumbo Cr.(UM)    | 2 Jul 84    | 06-02 |               | 29            | 48            |               |               | 14            |               |
| 131    | Jumbo Cr.(UM)    | 2 Jul 84    | 30-05 |               | 34            | 30            |               |               | 43            |               |
| 132    | Jumbo Cr.(UM)    | 2 Jul 84    | 20-07 |               | 7             | 27            |               |               | 2             |               |
| 133    | Jumbo Cr.(UM)    | 21 Jul 84   | 29-03 |               | 38            | 71            |               |               | 92            |               |
| 134    | Jumbo Cr.(UM)    | 21 Jul 84   | 12-06 |               | 17            | 32            |               |               | 134           |               |
| 135    | Jumbo Cr.(UM)    | 21 Jul 84   | 09-02 |               | 7             | 22            |               |               | 20            |               |
| 136    | Jumbo Cr.(UM)    | 21 Jul 84   | 24-04 |               | 18            | 24            |               |               | 306           | 1             |
| 137    | Jumbo Cr.(UM)    | 13 Aug 84   | 11-03 |               | 9             | 21            |               |               | 9             |               |
| 138    | Jumbo Cr.(UM)    | 13 Aug 84   | 06-03 |               | 1             | 2             |               |               |               | 1             |
| 139    | Jumbo Cr.(UM)    | 13 Aug 84   | 04-03 |               | 12            | 30            |               |               | 8             |               |
| 140    | Jumbo Cr.(UM)    | 13 Aug 84   | 09-05 |               | 12            | 28            |               |               | 13            |               |
| 141    | Jumbo Cr.(UM)    | 3 Sep 84    | 14-03 |               |               | 1             | 1             |               | 5             |               |
| 142    | Jumbo Cr.(UM)    | 3 Sep 84    | 28-05 |               | 6             | 16            |               | 5             | 13            |               |
| 143    | Jumbo Cr.(UM)    | 3 Sep 84    | 11-13 |               |               | 11            |               |               | 18            |               |
| 144    | Jumbo Cr.(UM)    | 3 Sep 84    | 25-06 |               | 23            | 7             |               |               | 259           |               |
| 145    | Jumbo Cr.(UM)    | 17 Sep 84   | 06-04 |               | 7             | 7             |               | 1             | 11            |               |
| 146    | Jumbo Cr.(UM)    | 17 Sep 84   | 12-03 |               | 1             |               |               |               | 9             |               |
| 147    | Jumbo Cr.(UM)    | 17 Sep 84   | 07-10 |               |               |               |               |               | 1             |               |
| 148    | Jumbo Cr.(UM)    | 17 Sep 84   | 15-08 |               | 4             |               |               | 4             | 3             |               |
| 149    |                  |             |       |               |               |               |               |               |               |               |
| 150    | GRAND TOTAL      |             |       |               | 602           | 1183          | 1             | 23            | 2032          | 42            |
| 151    | ELD COUNT        |             |       |               | 18            | 7             | 0             | 3             | 22            | 7             |
| 152    | ELD/MIX COUNT    |             |       |               | 13            | 4             | 0             | 1             | 8             | 1             |
| 153    | SLATE(M) COUNT   |             |       |               | 4             | 0             | 0             | 0             | 5             | 0             |
| 154    | STAMPEDE COUNT   |             |       |               | 0             | 0             | 0             | 0             | 13            | 0             |
| 155    | STAMP(M) COUNT   |             |       |               | 0             | 0             | 0             | 0             | 6             | 1             |
| 156    | JUMBO COUNT      |             |       |               | 21            | 21            | 1             | 3             | 23            | 0             |

| 1      | 2                 | 3           | 4     | 47         | 48           | 49            | 50            | 51            | 52            | 53            |
|--------|-------------------|-------------|-------|------------|--------------|---------------|---------------|---------------|---------------|---------------|
| STREAM | DATE              | SAMPLE LOC. |       | Plecoptera | Plecoptera   | Plecoptera    | Plecoptera    | Plecoptera    | Plecoptera    | Plecoptera    |
| 2      |                   |             |       | Capnidae   | Capnidae     | Chloroperidae | Chloroperidae | Chloroperidae | Chloroperidae | Chloroperidae |
| 3      |                   |             |       | Capna      | unidentified | Alloperla     | Neuroperla    | Paraperla     | Plumipera     | unidentified  |
| 4      |                   |             |       |            |              |               |               |               |               |               |
| 5      | Eldorado Cr. (UM) | 16 Jun 84   | 26-04 |            |              | 1             |               |               |               | 9             |
| 6      | Eldorado Cr. (UM) | 16 Jun 84   | 02-02 |            |              |               |               |               |               | 2             |
| 7      | Eldorado Cr. (UM) | 16 Jun 84   | 06-04 |            |              |               |               |               |               | 1             |
| 8      | Eldorado Cr. (UM) | 16 Jun 84   | 04-05 |            |              |               |               |               |               | 1             |
| 9      | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |            |              |               |               |               |               |               |
| 10     | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |            |              |               |               |               |               |               |
| 11     | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |            |              |               |               |               |               |               |
| 12     | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 |            |              |               |               |               |               |               |
| 13     | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |            |              |               |               |               |               |               |
| 14     | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |            |              |               |               |               |               |               |
| 15     | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 |            |              |               |               |               |               |               |
| 16     | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 |            |              |               |               |               |               |               |
| 17     | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |            |              |               |               |               |               |               |
| 18     | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |            |              |               |               |               |               |               |
| 19     | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 |            |              |               |               |               |               | 1             |
| 20     | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |            |              |               |               |               |               | 7             |
| 21     | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |            |              |               |               |               |               |               |
| 22     | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 |            |              |               |               |               |               |               |
| 23     | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |            |              | 2             |               |               |               | 2             |
| 24     | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |            |              | 3             |               |               |               |               |
| 25     | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |            |              |               |               |               |               |               |
| 26     | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |            |              |               |               |               |               |               |
| 27     | Eldorado Cr. (UM) | 16 Sep 84   | 06-02 |            | 3            |               |               |               |               | 2             |
| 28     | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |            | 1            |               |               |               | 2             |               |
| 29     | Eldorado Cr. (M)  | 16 Jun 84   | 06-04 |            |              |               |               |               |               | 4             |
| 30     | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |            |              |               |               |               |               | 3             |
| 31     | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |            |              |               | 3             |               |               |               |
| 32     | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |            |              |               |               |               |               | 4             |
| 33     | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |            |              |               |               |               |               | 7             |
| 34     | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |            |              |               |               |               | 3             | 1             |
| 35     | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |            |              |               |               |               |               | 3             |
| 36     | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |            |              |               |               |               |               | 2             |
| 37     | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |            |              |               |               |               | 1             | 2             |
| 38     | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |            |              |               |               |               |               | 23            |
| 39     | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |            |              |               |               |               |               | 2             |
| 40     | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |            |              |               |               |               |               | 6             |
| 41     | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |            |              | 3             |               |               | 1             | 8             |
| 42     | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 |            |              | 2             |               |               |               | 1             |
| 43     | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |            |              | 4             |               |               | 6             |               |
| 44     | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |            |              | 2             |               |               |               | 2             |
| 45     | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |            |              | 9             |               |               |               | 6             |
| 46     | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |            |              | 4             |               |               | 5             |               |
| 47     | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |            |              | 5             |               |               |               | 4             |
| 48     | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 |            | 4            |               |               |               |               | 2             |
| 49     | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |            |              | 3             |               |               |               | 7             |
| 50     | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |            | 4            |               |               |               |               | 6             |
| 51     | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |            | 2            |               |               |               |               | 7             |
| 52     | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |            | 2            |               |               |               |               |               |
| 53     | Slate Cr. (M)     | 16 Jun 84   | 01-05 |            |              |               |               |               | 7             |               |
| 54     | Slate Cr. (M)     | 16 Jun 84   | 25-05 |            |              |               |               |               |               |               |
| 55     | Slate Cr. (M)     | 16 Jun 84   | 20-02 |            |              |               |               |               |               |               |
| 56     | Slate Cr. (M)     | 16 Jun 84   | 23-02 |            |              |               |               |               |               |               |
| 57     | Slate Cr. (M)     | 30 Jun 84   | 22-03 |            |              |               |               |               |               |               |
| 58     | Slate Cr. (M)     | 30 Jun 84   | 25-01 |            |              |               |               |               |               |               |
| 59     | Slate Cr. (M)     | 30 Jun 84   | 02-03 |            |              |               |               |               |               |               |
| 60     | Slate Cr. (M)     | 30 Jun 84   | 14-02 |            |              |               |               |               |               |               |
| 61     | Slate Cr. (M)     | 23 Jul 84   | 09-01 |            |              | 1             |               |               |               |               |
| 62     | Slate Cr. (M)     | 23 Jul 84   | 28-02 |            |              | 1             |               |               |               |               |
| 63     | Slate Cr. (M)     | 23 Jul 84   | 05-04 |            |              | 1             |               |               |               | 1             |
| 64     | Slate Cr. (M)     | 23 Jul 84   | 11-00 |            |              | 2             |               |               |               | 1             |
| 65     | Slate Cr. (M)     | 12 Aug 84   | 22-02 |            |              | 1             |               |               |               |               |
| 66     | Slate Cr. (M)     | 12 Aug 84   | 24-03 |            |              |               |               |               |               |               |
| 67     | Slate Cr. (M)     | 12 Aug 84   | 19-05 |            |              | 1             |               |               |               |               |
| 68     | Slate Cr. (M)     | 12 Aug 84   | 01-01 |            |              |               |               |               |               |               |
| 69     | Slate Cr. (M)     | 2 Sep 84    | 16-03 |            |              | 3             |               |               |               |               |
| 70     | Slate Cr. (M)     | 2 Sep 84    | 07-02 |            | 2            | 1             |               |               |               |               |
| 71     | Slate Cr. (M)     | 2 Sep 84    | 14-05 |            |              | 2             |               |               |               | 1             |
| 72     | Slate Cr. (M)     | 2 Sep 84    | 09-02 |            | 4            |               |               |               |               | 1             |
| 73     | Slate Cr. (M)     | 16 Sep 84   | 10-02 |            |              | 12            |               |               |               | 3             |
| 74     | Slate Cr. (M)     | 16 Sep 84   | 03-03 |            | 7            |               |               |               |               | 2             |
| 75     | Slate Cr. (M)     | 16 Sep 84   | 24-04 |            |              | 6             |               |               |               | 1             |
| 76     | Slate Cr. (M)     | 16 Sep 84   | 23-02 |            |              | 4             |               |               |               |               |
| 77     | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |            |              |               |               |               |               |               |
| 78     | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |            |              |               |               |               |               |               |
| 79     | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |            |              |               |               |               |               | 1             |
| 80     | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |            |              |               |               |               |               |               |
| 81     | Stampede Cr. (UM) | 1 Jul 84    | 06-00 |            | 4            |               |               |               | 1             |               |
| 82     | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |            | 8            |               | 1             |               | 3             |               |
| 83     | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |            | 2            |               |               |               |               |               |
| 84     | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |            | 7            |               |               |               |               | 3             |
| 85     | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |            | 49           |               |               |               |               |               |
| 86     | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |            | 37           |               |               |               |               |               |
| 87     | Stampede Cr. (UM) | 22 Jul 84   | 03-00 |            |              | 30            |               |               |               | 1             |
| 88     | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |            | 34           |               |               |               | 3             |               |
| 89     | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |            |              | 114           |               |               |               | 14            |
| 90     | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |            |              | 50            |               | 3             |               |               |
| 91     | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |            | 13           | 39            |               |               |               |               |
| 92     | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |            |              | 46            |               |               | 1             |               |
| 93     | Stampede Cr. (UM) | 1 Sep 84    | 17-04 |            | 78           |               |               |               |               |               |
| 94     | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |            | 78           | 21            |               |               |               | 1             |
| 95     | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |            | 107          |               |               |               |               | 4             |
| 96     | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |            | 108          |               | 2             |               |               |               |
| 97     | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |            |              | 43            |               |               |               | 2             |
| 98     | Stampede Cr. (UM) | 15 Sep 84   | 13-04 |            | 3            |               |               |               |               |               |

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| 1      | 2                 | 3          | 4     | 54         | 55           | 56         | 57         | 58         | 59           | 60           |
|--------|-------------------|------------|-------|------------|--------------|------------|------------|------------|--------------|--------------|
| STREAM | DATE              | SAMPLE LOC |       | Plecoptera | Plecoptera   | Plecoptera | Plecoptera | Plecoptera | Plecoptera   | Plecoptera   |
|        |                   |            |       | Leuctridae | Leuctridae   | Nemouridae | Nemouridae | Nemouridae | Nemouridae   | Periodidae   |
|        |                   |            |       | Periomyia  | unidentified | Nemoura    | Podmosta   | Zapada     | unidentified | Arcynopteryx |
| 5      | Eldorado Cr. (UM) | 18 Jun 84  | 28-04 |            |              |            |            |            | 254          |              |
| 6      | Eldorado Cr. (UM) | 18 Jun 84  | 02-02 |            |              |            |            |            | 56           |              |
| 7      | Eldorado Cr. (UM) | 18 Jun 84  | 06-04 |            |              |            |            |            | 42           |              |
| 8      | Eldorado Cr. (UM) | 18 Jun 84  | 04-05 |            |              |            |            |            | 4            |              |
| 9      | Eldorado Cr. (UM) | 30 Jun 84  | 13-04 |            |              |            |            |            | 24           |              |
| 10     | Eldorado Cr. (UM) | 30 Jun 84  | 08-04 |            |              |            |            |            | 35           |              |
| 11     | Eldorado Cr. (UM) | 30 Jun 84  | 01-00 |            |              |            |            |            | 151          |              |
| 12     | Eldorado Cr. (UM) | 30 Jun 84  | 20-03 |            |              |            |            |            | 52           |              |
| 13     | Eldorado Cr. (UM) | 23 Jul 84  | 30-09 |            |              |            | 1          |            | 35           |              |
| 14     | Eldorado Cr. (UM) | 23 Jul 84  | 24-02 |            |              |            |            |            | 29           |              |
| 15     | Eldorado Cr. (UM) | 23 Jul 84  | 05-04 |            |              |            |            |            | 288          |              |
| 16     | Eldorado Cr. (UM) | 23 Jul 84  | 18-04 |            |              |            |            |            | 221          |              |
| 17     | Eldorado Cr. (UM) | 12 Aug 84  | 12-01 |            |              |            |            |            | 132          |              |
| 18     | Eldorado Cr. (UM) | 12 Aug 84  | 14-03 |            |              |            |            |            | 259          |              |
| 19     | Eldorado Cr. (UM) | 12 Aug 84  | 26-02 |            |              |            |            |            | 213          |              |
| 20     | Eldorado Cr. (UM) | 12 Aug 84  | 08-03 |            |              |            |            |            | 45           |              |
| 21     | Eldorado Cr. (UM) | 2 Sep 84   | 03-02 |            |              |            |            |            | 152          |              |
| 22     | Eldorado Cr. (UM) | 2 Sep 84   | 29-03 |            |              |            |            |            | 217          |              |
| 23     | Eldorado Cr. (UM) | 2 Sep 84   | 21-01 |            |              | 4          | 9          |            | 212          |              |
| 24     | Eldorado Cr. (UM) | 2 Sep 84   | 08-02 |            |              |            |            |            | 151          |              |
| 25     | Eldorado Cr. (UM) | 18 Sep 84  | 19-07 |            |              |            |            |            | 2            |              |
| 26     | Eldorado Cr. (UM) | 18 Sep 84  | 11-09 |            |              |            |            |            | 198          | 22           |
| 27     | Eldorado Cr. (UM) | 18 Sep 84  | 06-02 |            |              |            |            |            | 50           |              |
| 28     | Eldorado Cr. (UM) | 18 Sep 84  | 02-02 |            |              |            |            |            | 104          |              |
| 29     | Eldorado Cr. (M)  | 18 Jun 84  | 06-04 |            |              |            |            |            | 4            |              |
| 30     | Eldorado Cr. (M)  | 18 Jun 84  | 12-04 |            |              |            |            |            |              |              |
| 31     | Eldorado Cr. (M)  | 18 Jun 84  | 15-01 |            |              | 1          |            |            |              |              |
| 32     | Eldorado Cr. (M)  | 18 Jun 84  | 23-01 |            |              |            |            |            |              |              |
| 33     | Eldorado Cr. (M)  | 30 Jun 84  | 23-03 |            |              |            |            | 1          |              |              |
| 34     | Eldorado Cr. (M)  | 30 Jun 84  | 00-02 |            |              |            | 1          | 2          |              |              |
| 35     | Eldorado Cr. (M)  | 30 Jun 84  | 18-02 |            |              |            |            |            |              |              |
| 36     | Eldorado Cr. (M)  | 30 Jun 84  | 05-04 |            |              |            |            |            |              |              |
| 37     | Eldorado Cr. (M)  | 23 Jul 84  | 01-02 |            |              |            | 1          | 9          |              |              |
| 38     | Eldorado Cr. (M)  | 23 Jul 84  | 02-04 |            |              |            |            | 6          |              |              |
| 39     | Eldorado Cr. (M)  | 23 Jul 84  | 27-01 |            |              |            | 1          | 4          |              |              |
| 40     | Eldorado Cr. (M)  | 23 Jul 84  | 01-04 |            |              |            |            | 2          |              |              |
| 41     | Eldorado Cr. (M)  | 12 Aug 84  | 07-04 |            |              |            |            |            |              |              |
| 42     | Eldorado Cr. (M)  | 12 Aug 84  | 13-01 |            |              |            |            |            |              |              |
| 43     | Eldorado Cr. (M)  | 12 Aug 84  | 26-03 |            |              |            |            | 3          |              |              |
| 44     | Eldorado Cr. (M)  | 12 Aug 84  | 10-01 |            |              |            | 2          | 2          |              |              |
| 45     | Eldorado Cr. (M)  | 2 Sep 84   | 02-02 |            |              |            | 8          | 11         | 1            |              |
| 46     | Eldorado Cr. (M)  | 2 Sep 84   | 08-03 |            |              |            |            |            |              |              |
| 47     | Eldorado Cr. (M)  | 2 Sep 84   | 01-05 |            |              |            |            | 5          |              |              |
| 48     | Eldorado Cr. (M)  | 2 Sep 84   | 13-02 |            |              | 2          |            | 1          | 2            |              |
| 49     | Eldorado Cr. (M)  | 18 Sep 84  | 09-04 |            |              |            |            | 15         | 3            |              |
| 50     | Eldorado Cr. (M)  | 18 Sep 84  | 18-02 |            |              |            | 5          | 11         |              |              |
| 51     | Eldorado Cr. (M)  | 18 Sep 84  | 14-03 |            |              |            | 5          | 3          |              |              |
| 52     | Eldorado Cr. (M)  | 18 Sep 84  | 17-04 |            |              |            | 4          |            |              |              |
| 53     | Slate Cr. (M)     | 18 Jun 84  | 01-05 |            |              | 1          |            |            |              |              |
| 54     | Slate Cr. (M)     | 18 Jun 84  | 25-05 |            |              |            |            |            |              |              |
| 55     | Slate Cr. (M)     | 18 Jun 84  | 20-02 |            |              |            |            |            |              |              |
| 56     | Slate Cr. (M)     | 18 Jun 84  | 23-02 |            |              |            |            |            |              |              |
| 57     | Slate Cr. (M)     | 30 Jun 84  | 22-03 |            |              |            |            |            |              |              |
| 58     | Slate Cr. (M)     | 30 Jun 84  | 25-01 |            |              |            |            |            |              |              |
| 59     | Slate Cr. (M)     | 30 Jun 84  | 02-03 |            |              |            |            |            |              |              |
| 60     | Slate Cr. (M)     | 30 Jun 84  | 14-02 |            |              |            | 1          |            |              |              |
| 61     | Slate Cr. (M)     | 23 Jul 84  | 09-01 |            |              |            |            |            |              |              |
| 62     | Slate Cr. (M)     | 23 Jul 84  | 28-02 |            |              |            |            |            |              |              |
| 63     | Slate Cr. (M)     | 23 Jul 84  | 05-04 |            |              | 1          |            | 1          |              |              |
| 64     | Slate Cr. (M)     | 23 Jul 84  | 11-00 |            |              |            |            |            |              |              |
| 65     | Slate Cr. (M)     | 12 Aug 84  | 22-02 |            |              | 1          |            |            |              |              |
| 66     | Slate Cr. (M)     | 12 Aug 84  | 24-03 |            |              |            |            |            |              | 1            |
| 67     | Slate Cr. (M)     | 12 Aug 84  | 19-05 |            |              |            |            |            |              |              |
| 68     | Slate Cr. (M)     | 12 Aug 84  | 01-01 |            |              |            |            |            |              | 1            |
| 69     | Slate Cr. (M)     | 2 Sep 84   | 18-03 |            |              | 7          | 5          | 12         |              |              |
| 70     | Slate Cr. (M)     | 2 Sep 84   | 07-02 |            |              | 3          |            | 1          |              |              |
| 71     | Slate Cr. (M)     | 2 Sep 84   | 14-05 |            |              | 3          |            | 5          |              | 6            |
| 72     | Slate Cr. (M)     | 2 Sep 84   | 09-02 |            |              | 7          | 2          | 2          |              |              |
| 73     | Slate Cr. (M)     | 18 Sep 84  | 10-02 |            |              | 19         |            | 15         |              |              |
| 74     | Slate Cr. (M)     | 18 Sep 84  | 03-03 |            |              |            | 11         | 13         | 17           |              |
| 75     | Slate Cr. (M)     | 18 Sep 84  | 24-04 |            |              | 6          |            | 16         | 8            |              |
| 76     | Slate Cr. (M)     | 18 Sep 84  | 23-02 |            |              | 4          |            | 10         |              |              |
| 77     | Stampede Cr. (UM) | 17 Jun 84  | 00-02 |            |              | 2          | 23         | 2          |              |              |
| 78     | Stampede Cr. (UM) | 17 Jun 84  | 09-00 |            |              |            | 6          |            |              |              |
| 79     | Stampede Cr. (UM) | 17 Jun 84  | 02-05 |            |              | 2          | 12         |            |              |              |
| 80     | Stampede Cr. (UM) | 17 Jun 84  | 06-02 |            |              |            | 2          |            |              | 1            |
| 81     | Stampede Cr. (UM) | 1 Jul 84   | 06-00 |            |              | 5          | 21         | 4          |              |              |
| 82     | Stampede Cr. (UM) | 1 Jul 84   | 08-03 |            |              | 6          | 61         | 3          | 3            |              |
| 83     | Stampede Cr. (UM) | 1 Jul 84   | 00-01 |            |              |            |            | 1          | 2            |              |
| 84     | Stampede Cr. (UM) | 1 Jul 84   | 29-04 |            |              |            | 42         | 5          |              |              |
| 85     | Stampede Cr. (UM) | 22 Jul 84  | 23-02 |            |              | 4          | 14         |            |              |              |
| 86     | Stampede Cr. (UM) | 22 Jul 84  | 00-04 |            |              | 2          | 12         |            |              |              |
| 87     | Stampede Cr. (UM) | 22 Jul 84  | 05-00 |            |              | 3          | 8          | 1          |              |              |
| 88     | Stampede Cr. (UM) | 22 Jul 84  | 30-00 |            |              |            |            |            |              |              |
| 89     | Stampede Cr. (UM) | 11 Aug 84  | 23-04 |            |              |            | 14         | 3          | 7            |              |
| 90     | Stampede Cr. (UM) | 11 Aug 84  | 22-01 |            |              | 3          | 6          |            |              |              |
| 91     | Stampede Cr. (UM) | 11 Aug 84  | 01-01 |            |              |            |            | 2          |              |              |
| 92     | Stampede Cr. (UM) | 11 Aug 84  | 02-04 |            |              | 11         |            | 3          |              |              |
| 93     | Stampede Cr. (UM) | 1 Sep 84   | 17-04 |            |              | 8          |            |            |              |              |
| 94     | Stampede Cr. (UM) | 1 Sep 84   | 28-04 |            |              | 7          |            |            |              |              |
| 95     | Stampede Cr. (UM) | 1 Sep 84   | 12-02 |            |              |            | 1          | 1          | 3            |              |
| 96     | Stampede Cr. (UM) | 1 Sep 84   | 22-03 |            |              | 1          | 5          | 2          |              |              |
| 97     | Stampede Cr. (UM) | 15 Sep 84  | 08-01 |            |              | 5          |            | 1          |              | 4            |
| 98     | Stampede Cr. (UM) | 15 Sep 84  | 13-04 |            |              |            | 2          |            |              |              |





| 1      | 2                 | 3           | 4     | 61         | 62           | 63               | 64               | 65           | 66            | 67            |
|--------|-------------------|-------------|-------|------------|--------------|------------------|------------------|--------------|---------------|---------------|
| STREAM | DATE              | SAMPLE LOC. |       | Plecoptera | Plecoptera   | Plecoptera       | Plecoptera       | Plecoptera   | Trichoptera   | Trichoptera   |
|        |                   |             |       | Periodidae | Periodidae   | Taeniopterygidae | Taeniopterygidae | unidentified | Limnephilidae | Limnephilidae |
|        |                   |             |       | Isoparia   | unidentified | Taenionema       | unidentified     |              | Apatania      | Ecclisomyia   |
| 5      | Eldorado Cr. (UM) | 16 Jun 84   | 26-04 |            | 3            |                  |                  |              |               |               |
| 6      | Eldorado Cr. (UM) | 16 Jun 84   | 02-02 |            |              |                  |                  |              | 1             |               |
| 7      | Eldorado Cr. (UM) | 16 Jun 84   | 06-04 |            |              | 1                |                  |              |               |               |
| 8      | Eldorado Cr. (UM) | 16 Jun 84   | 04-05 |            |              |                  |                  |              |               |               |
| 9      | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |            |              |                  |                  |              |               |               |
| 10     | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |            |              | 5                |                  |              |               |               |
| 11     | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |            |              | 4                |                  | 2            | 2             |               |
| 12     | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 |            |              | 2                |                  |              |               |               |
| 13     | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |            |              | 3                |                  |              |               | 2             |
| 14     | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |            |              |                  |                  |              |               |               |
| 15     | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 | 2          | 1            |                  |                  |              |               | 15            |
| 16     | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 |            | 2            |                  |                  |              |               |               |
| 17     | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |            | 1            |                  |                  |              |               |               |
| 18     | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |            |              |                  |                  |              |               |               |
| 19     | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 |            |              |                  |                  |              |               | 4             |
| 20     | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |            | 1            |                  |                  |              |               |               |
| 21     | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |            | 7            |                  |                  |              |               | 10            |
| 22     | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 |            | 1            |                  |                  | 5            |               |               |
| 23     | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |            |              |                  |                  | 2            |               |               |
| 24     | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |            | 2            |                  |                  | 4            |               | 9             |
| 25     | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |            |              |                  |                  |              |               |               |
| 26     | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |            |              |                  |                  |              |               | 5             |
| 27     | Eldorado Cr. (UM) | 16 Sep 84   | 06-02 |            | 5            |                  |                  |              |               |               |
| 28     | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |            | 27           |                  |                  |              |               | 10            |
| 29     | Eldorado Cr. (M)  | 16 Jun 84   | 06-04 |            |              |                  |                  |              |               |               |
| 30     | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |            |              |                  |                  |              |               |               |
| 31     | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |            |              |                  |                  |              |               |               |
| 32     | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |            |              |                  |                  |              |               |               |
| 33     | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |            |              |                  |                  |              |               |               |
| 34     | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |            |              |                  |                  |              |               |               |
| 35     | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |            |              |                  |                  |              |               |               |
| 36     | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |            | 1            |                  |                  |              |               |               |
| 37     | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |            |              |                  |                  |              |               |               |
| 38     | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |            |              |                  |                  |              |               |               |
| 39     | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |            |              |                  |                  |              |               |               |
| 40     | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |            |              |                  |                  |              |               |               |
| 41     | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |            | 2            |                  |                  |              |               |               |
| 42     | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 |            |              |                  |                  | 1            |               | 1             |
| 43     | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |            |              |                  |                  |              |               |               |
| 44     | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |            |              |                  |                  |              |               |               |
| 45     | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |            |              |                  |                  | 1            |               |               |
| 46     | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |            |              |                  |                  | 4            |               |               |
| 47     | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |            |              |                  | 12               |              |               |               |
| 48     | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 |            |              |                  |                  | 4            |               |               |
| 49     | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |            |              |                  | 4                |              |               |               |
| 50     | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |            |              |                  | 1                |              |               |               |
| 51     | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |            |              |                  |                  |              |               | 1             |
| 52     | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |            |              |                  |                  |              |               |               |
| 53     | Slate Cr. (M)     | 16 Jun 84   | 01-05 |            |              |                  |                  |              |               |               |
| 54     | Slate Cr. (M)     | 16 Jun 84   | 25-05 |            |              |                  |                  |              |               |               |
| 55     | Slate Cr. (M)     | 16 Jun 84   | 20-02 |            |              |                  |                  |              |               |               |
| 56     | Slate Cr. (M)     | 16 Jun 84   | 23-02 |            |              |                  |                  |              |               |               |
| 57     | Slate Cr. (M)     | 30 Jun 84   | 22-03 |            |              |                  |                  |              |               |               |
| 58     | Slate Cr. (M)     | 30 Jun 84   | 25-01 |            |              |                  |                  |              |               |               |
| 59     | Slate Cr. (M)     | 30 Jun 84   | 02-03 |            |              |                  |                  |              |               |               |
| 60     | Slate Cr. (M)     | 30 Jun 84   | 14-02 |            |              |                  |                  |              |               |               |
| 61     | Slate Cr. (M)     | 23 Jul 84   | 09-01 |            |              |                  |                  |              |               |               |
| 62     | Slate Cr. (M)     | 23 Jul 84   | 28-02 |            |              |                  |                  |              |               |               |
| 63     | Slate Cr. (M)     | 23 Jul 84   | 05-04 |            |              |                  |                  |              |               |               |
| 64     | Slate Cr. (M)     | 23 Jul 84   | 11-00 |            |              |                  |                  |              |               |               |
| 65     | Slate Cr. (M)     | 12 Aug 84   | 22-02 |            |              |                  |                  | 1            |               |               |
| 66     | Slate Cr. (M)     | 12 Aug 84   | 24-03 |            |              |                  |                  |              |               |               |
| 67     | Slate Cr. (M)     | 12 Aug 84   | 19-05 |            | 8            |                  |                  |              |               |               |
| 68     | Slate Cr. (M)     | 12 Aug 84   | 01-01 |            |              |                  |                  |              |               |               |
| 69     | Slate Cr. (M)     | 2 Sep 84    | 16-03 |            |              |                  |                  |              |               | 1             |
| 70     | Slate Cr. (M)     | 2 Sep 84    | 07-02 |            |              |                  |                  |              |               |               |
| 71     | Slate Cr. (M)     | 2 Sep 84    | 14-05 |            |              |                  | 5                |              |               |               |
| 72     | Slate Cr. (M)     | 2 Sep 84    | 09-02 |            |              |                  |                  |              |               |               |
| 73     | Slate Cr. (M)     | 16 Sep 84   | 10-02 |            |              |                  |                  |              |               |               |
| 74     | Slate Cr. (M)     | 16 Sep 84   | 03-03 |            |              |                  |                  | 1            |               |               |
| 75     | Slate Cr. (M)     | 16 Sep 84   | 24-04 |            |              |                  |                  |              |               |               |
| 76     | Slate Cr. (M)     | 16 Sep 84   | 23-02 |            |              |                  |                  |              |               |               |
| 77     | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |            |              |                  | 1                |              |               |               |
| 78     | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |            |              |                  |                  |              |               |               |
| 79     | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |            |              |                  |                  |              |               |               |
| 80     | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |            |              |                  |                  |              |               |               |
| 81     | Stampede Cr. (UM) | 1 Jul 84    | 06-00 |            |              |                  |                  |              |               |               |
| 82     | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |            |              |                  |                  |              |               |               |
| 83     | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |            |              |                  |                  |              |               |               |
| 84     | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |            | 1            |                  |                  |              |               |               |
| 85     | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |            |              |                  | 2                |              |               |               |
| 86     | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |            |              |                  |                  |              |               |               |
| 87     | Stampede Cr. (UM) | 22 Jul 84   | 05-00 |            |              |                  |                  |              |               |               |
| 88     | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |            |              |                  |                  |              |               |               |
| 89     | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |            | 11           |                  |                  |              |               |               |
| 90     | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |            |              |                  | 3                |              |               |               |
| 91     | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |            |              |                  |                  | 1            |               |               |
| 92     | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |            |              | 1                |                  |              |               |               |
| 93     | Stampede Cr. (UM) | 1 Sep 84    | 17-04 | 2          |              | 3                |                  |              |               |               |
| 94     | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |            |              |                  |                  |              |               |               |
| 95     | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |            | 7            |                  | 3                | 42           |               |               |
| 96     | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |            |              |                  |                  |              |               |               |
| 97     | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |            | 2            |                  |                  | 1            |               |               |
| 98     | Stampede Cr. (UM) | 15 Sep 84   | 13-04 | 1          |              |                  |                  |              |               |               |

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| 1      | 2                 | 3           | 4     | 68             | 69          | 70         | 71         | 72          | 73       | 74              |
|--------|-------------------|-------------|-------|----------------|-------------|------------|------------|-------------|----------|-----------------|
| STREAM | DATE              | SAMPLE LOC. |       | Trichoptera    | Trichoptera | Arthropoda | Arthropoda | Arthropoda  | Nematoda | Platyhelminthes |
|        |                   |             |       | Limnephiliidae | Rhyacophila | Copepoda   | Ostracoda  | Hydracarina |          |                 |
|        |                   |             |       | unidentified   |             |            |            |             |          |                 |
| 5      | Eldorado Cr. (UM) | 16 Jun 84   | 26-04 |                |             |            | 115        | 79          |          | 81              |
| 6      | Eldorado Cr. (UM) | 16 Jun 84   | 02-02 | 1              |             |            | 137        | 33          |          | 30              |
| 7      | Eldorado Cr. (UM) | 16 Jun 84   | 06-04 |                |             |            | 868        | 72          |          | 131             |
| 8      | Eldorado Cr. (UM) | 16 Jun 84   | 04-05 |                |             |            | 2          | 2           |          |                 |
| 9      | Eldorado Cr. (UM) | 30 Jun 84   | 13-04 |                |             |            | 134        |             |          | 2               |
| 10     | Eldorado Cr. (UM) | 30 Jun 84   | 08-04 |                |             |            | 732        | 15          |          | 60              |
| 11     | Eldorado Cr. (UM) | 30 Jun 84   | 01-00 |                |             |            | 590        | 284         |          | 2               |
| 12     | Eldorado Cr. (UM) | 30 Jun 84   | 20-03 | 1              |             |            | 4          | 20          |          | 2               |
| 13     | Eldorado Cr. (UM) | 23 Jul 84   | 30-09 |                |             |            | 861        | 23          |          | 94              |
| 14     | Eldorado Cr. (UM) | 23 Jul 84   | 24-02 |                |             |            | 59         | 7           |          | 5               |
| 15     | Eldorado Cr. (UM) | 23 Jul 84   | 05-04 |                |             |            |            | 259         | 4        | 443             |
| 16     | Eldorado Cr. (UM) | 23 Jul 84   | 18-04 | 1              |             |            | 424        | 100         | 3        | 53              |
| 17     | Eldorado Cr. (UM) | 12 Aug 84   | 12-01 |                |             |            | 459        | 50          |          | 47              |
| 18     | Eldorado Cr. (UM) | 12 Aug 84   | 14-03 |                |             |            | 932        | 60          | 12       | 65              |
| 19     | Eldorado Cr. (UM) | 12 Aug 84   | 26-02 | 1              |             |            | 981        | 77          | 5        | 150             |
| 20     | Eldorado Cr. (UM) | 12 Aug 84   | 08-03 |                |             |            | 267        | 8           |          | 50              |
| 21     | Eldorado Cr. (UM) | 2 Sep 84    | 03-02 |                |             |            | 808        | 54          | 32       | 173             |
| 22     | Eldorado Cr. (UM) | 2 Sep 84    | 29-03 | 2              |             |            | 1008       | 89          | 4        | 190             |
| 23     | Eldorado Cr. (UM) | 2 Sep 84    | 21-01 |                |             |            | 308        | 76          | 38       | 132             |
| 24     | Eldorado Cr. (UM) | 2 Sep 84    | 08-02 |                |             |            | 649        | 52          |          | 116             |
| 25     | Eldorado Cr. (UM) | 16 Sep 84   | 19-07 |                |             |            | 578        | 2           | 31       | 9               |
| 26     | Eldorado Cr. (UM) | 16 Sep 84   | 11-09 |                |             |            | 926        | 39          | 10       | 84              |
| 27     | Eldorado Cr. (UM) | 16 Sep 84   | 06-02 |                |             |            | 899        | 16          |          | 87              |
| 28     | Eldorado Cr. (UM) | 16 Sep 84   | 02-02 |                |             |            | 1134       | 47          | 3        | 164             |
| 29     | Eldorado Cr. (M)  | 16 Jun 84   | 06-04 |                |             |            |            |             |          |                 |
| 30     | Eldorado Cr. (M)  | 16 Jun 84   | 12-04 |                |             |            |            |             | 1        |                 |
| 31     | Eldorado Cr. (M)  | 16 Jun 84   | 15-01 |                |             |            |            |             |          |                 |
| 32     | Eldorado Cr. (M)  | 16 Jun 84   | 23-01 |                |             |            | 2          |             |          | 1               |
| 33     | Eldorado Cr. (M)  | 30 Jun 84   | 23-03 |                |             |            |            |             |          |                 |
| 34     | Eldorado Cr. (M)  | 30 Jun 84   | 00-02 |                |             |            |            |             |          | 1               |
| 35     | Eldorado Cr. (M)  | 30 Jun 84   | 18-02 |                |             |            |            |             |          |                 |
| 36     | Eldorado Cr. (M)  | 30 Jun 84   | 05-04 |                |             |            |            |             |          |                 |
| 37     | Eldorado Cr. (M)  | 23 Jul 84   | 01-02 |                |             |            | 4          | 3           |          | 3               |
| 38     | Eldorado Cr. (M)  | 23 Jul 84   | 02-04 |                |             |            | 3          | 4           |          |                 |
| 39     | Eldorado Cr. (M)  | 23 Jul 84   | 27-01 |                |             |            |            |             |          | 3               |
| 40     | Eldorado Cr. (M)  | 23 Jul 84   | 01-04 |                |             |            | 1          | 2           |          | 2               |
| 41     | Eldorado Cr. (M)  | 12 Aug 84   | 07-04 |                |             |            | 3          |             |          | 1               |
| 42     | Eldorado Cr. (M)  | 12 Aug 84   | 13-01 | 1              |             |            | 15         |             |          | 2               |
| 43     | Eldorado Cr. (M)  | 12 Aug 84   | 26-03 |                |             |            | 1          | 1           | 2        | 1               |
| 44     | Eldorado Cr. (M)  | 12 Aug 84   | 10-01 |                |             |            |            |             | 1        |                 |
| 45     | Eldorado Cr. (M)  | 2 Sep 84    | 02-02 |                |             |            | 1          |             |          | 7               |
| 46     | Eldorado Cr. (M)  | 2 Sep 84    | 08-03 |                |             |            |            |             |          | 4               |
| 47     | Eldorado Cr. (M)  | 2 Sep 84    | 01-05 |                |             |            | 1          |             |          | 4               |
| 48     | Eldorado Cr. (M)  | 2 Sep 84    | 13-02 | 1              |             |            | 2          | 1           | 1        | 11              |
| 49     | Eldorado Cr. (M)  | 16 Sep 84   | 09-04 |                |             |            | 3          |             |          | 3               |
| 50     | Eldorado Cr. (M)  | 16 Sep 84   | 18-02 |                |             |            | 16         | 2           |          | 2               |
| 51     | Eldorado Cr. (M)  | 16 Sep 84   | 14-03 |                |             |            | 3          |             |          | 1               |
| 52     | Eldorado Cr. (M)  | 16 Sep 84   | 17-04 |                |             |            |            |             |          | 2               |
| 53     | Slate Cr. (M)     | 16 Jun 84   | 01-05 |                |             |            |            |             |          |                 |
| 54     | Slate Cr. (M)     | 16 Jun 84   | 25-05 |                |             |            | 1          |             |          |                 |
| 55     | Slate Cr. (M)     | 16 Jun 84   | 20-02 |                |             |            |            |             |          |                 |
| 56     | Slate Cr. (M)     | 16 Jun 84   | 23-02 |                |             |            |            |             |          | 1               |
| 57     | Slate Cr. (M)     | 30 Jun 84   | 22-03 |                |             |            |            |             |          |                 |
| 58     | Slate Cr. (M)     | 30 Jun 84   | 25-01 |                |             |            |            |             | 3        |                 |
| 59     | Slate Cr. (M)     | 30 Jun 84   | 02-03 |                |             |            |            |             |          |                 |
| 60     | Slate Cr. (M)     | 30 Jun 84   | 14-02 |                |             |            |            |             |          |                 |
| 61     | Slate Cr. (M)     | 23 Jul 84   | 09-01 |                |             |            |            |             |          |                 |
| 62     | Slate Cr. (M)     | 23 Jul 84   | 28-02 |                |             |            |            |             |          | 5               |
| 63     | Slate Cr. (M)     | 23 Jul 84   | 05-04 |                |             |            |            |             |          |                 |
| 64     | Slate Cr. (M)     | 23 Jul 84   | 11-00 |                |             |            |            |             |          |                 |
| 65     | Slate Cr. (M)     | 12 Aug 84   | 22-02 |                |             |            |            |             |          |                 |
| 66     | Slate Cr. (M)     | 12 Aug 84   | 24-03 |                |             |            |            | 1           |          | 2               |
| 67     | Slate Cr. (M)     | 12 Aug 84   | 19-05 |                |             |            |            |             |          |                 |
| 68     | Slate Cr. (M)     | 12 Aug 84   | 01-01 |                |             |            |            |             |          | 1               |
| 69     | Slate Cr. (M)     | 2 Sep 84    | 16-03 |                |             |            | 2          |             |          | 3               |
| 70     | Slate Cr. (M)     | 2 Sep 84    | 07-02 |                |             | 1          |            |             |          | 1               |
| 71     | Slate Cr. (M)     | 2 Sep 84    | 14-05 | 1              |             |            |            |             |          | 1               |
| 72     | Slate Cr. (M)     | 2 Sep 84    | 09-02 |                |             |            |            |             |          |                 |
| 73     | Slate Cr. (M)     | 16 Sep 84   | 10-02 |                |             |            | 3          |             |          | 1               |
| 74     | Slate Cr. (M)     | 16 Sep 84   | 03-03 |                |             |            | 2          |             |          | 1               |
| 75     | Slate Cr. (M)     | 16 Sep 84   | 24-04 |                |             |            | 1          | 1           |          | 2               |
| 76     | Slate Cr. (M)     | 16 Sep 84   | 23-02 |                |             |            |            | 1           |          |                 |
| 77     | Stampede Cr. (UM) | 17 Jun 84   | 00-02 |                |             |            |            | 1           |          |                 |
| 78     | Stampede Cr. (UM) | 17 Jun 84   | 09-00 |                |             |            |            |             |          |                 |
| 79     | Stampede Cr. (UM) | 17 Jun 84   | 02-05 |                |             |            |            |             |          |                 |
| 80     | Stampede Cr. (UM) | 17 Jun 84   | 06-02 |                |             |            |            |             |          |                 |
| 81     | Stampede Cr. (UM) | 1 Jul 84    | 05-00 |                |             |            |            |             |          | 2               |
| 82     | Stampede Cr. (UM) | 1 Jul 84    | 08-03 |                |             |            |            |             |          | 6               |
| 83     | Stampede Cr. (UM) | 1 Jul 84    | 00-01 |                |             |            |            |             |          |                 |
| 84     | Stampede Cr. (UM) | 1 Jul 84    | 29-04 |                |             |            |            |             |          |                 |
| 85     | Stampede Cr. (UM) | 22 Jul 84   | 23-02 |                |             |            |            |             | 1        |                 |
| 86     | Stampede Cr. (UM) | 22 Jul 84   | 00-04 |                |             |            |            |             |          | 1               |
| 87     | Stampede Cr. (UM) | 22 Jul 84   | 05-00 |                |             |            |            |             |          |                 |
| 88     | Stampede Cr. (UM) | 22 Jul 84   | 30-00 |                |             |            |            |             |          |                 |
| 89     | Stampede Cr. (UM) | 11 Aug 84   | 23-04 |                |             |            |            |             |          | 1               |
| 90     | Stampede Cr. (UM) | 11 Aug 84   | 22-01 |                |             |            | 1          | 1           |          |                 |
| 91     | Stampede Cr. (UM) | 11 Aug 84   | 01-01 |                |             |            |            |             |          | 7               |
| 92     | Stampede Cr. (UM) | 11 Aug 84   | 02-04 |                |             |            |            |             |          |                 |
| 93     | Stampede Cr. (UM) | 1 Sep 84    | 17-04 |                |             |            |            |             |          |                 |
| 94     | Stampede Cr. (UM) | 1 Sep 84    | 28-04 |                |             |            |            |             | 1        | 6               |
| 95     | Stampede Cr. (UM) | 1 Sep 84    | 12-02 |                |             |            |            |             |          |                 |
| 96     | Stampede Cr. (UM) | 1 Sep 84    | 22-03 |                |             |            |            |             |          | 4               |
| 97     | Stampede Cr. (UM) | 15 Sep 84   | 08-01 |                |             |            |            | 1           |          | 3               |
| 98     | Stampede Cr. (UM) | 19 Sep 84   | 13-04 |                |             |            |            |             |          | 1               |

| 1   | 2                | 3         | 4          | 68            | 69          | 70         | 71         | 72          | 73       | 74              |
|-----|------------------|-----------|------------|---------------|-------------|------------|------------|-------------|----------|-----------------|
| 1   | STREAM           | DATE      | SAMPLE LOC | Trichoptera   | Trichoptera | Arthropoda | Arthropoda | Arthropoda  | Nematoda | Platyhelminthes |
| 2   |                  |           |            | Limnephilidae | Rhyacophila | Crustacea  | Crustacea  | Hydracarina |          |                 |
| 3   |                  |           |            | unidentified  | Rhyacophila | Copepoda   | Ostracoda  |             |          |                 |
| 4   |                  |           |            |               |             |            |            |             |          |                 |
| 99  | Stampede Cr.(UM) | 15 Sep 84 | 30-03      |               |             |            |            |             |          | 7               |
| 100 | Stampede Cr.(UM) | 15 Sep 84 | 24-01      |               |             |            |            |             |          | 1               |
| 101 | Stampede Cr.(M)  | 17 Jun 84 | 08-00      |               |             |            |            |             |          |                 |
| 102 | Stampede Cr.(M)  | 17 Jun 84 | 22-00      |               |             |            |            |             |          |                 |
| 103 | Stampede Cr.(M)  | 17 Jun 84 | 03-04      |               |             |            |            |             | 1        |                 |
| 104 | Stampede Cr.(M)  | 17 Jun 84 | 00-03      |               |             |            |            | 2           |          |                 |
| 105 | Stampede Cr.(M)  | 1 Jul 84  | 21-01      |               |             |            |            |             |          | 2               |
| 106 | Stampede Cr.(M)  | 1 Jul 84  | 00-02      |               |             |            | 2          |             |          |                 |
| 107 | Stampede Cr.(M)  | 1 Jul 84  | 25-02      |               |             |            |            |             |          |                 |
| 108 | Stampede Cr.(M)  | 1 Jul 84  | 08-04      |               |             |            | 1          |             |          | 1               |
| 109 | Stampede Cr.(M)  | 22 Jul 84 | 25-04      |               |             |            |            |             |          |                 |
| 110 | Stampede Cr.(M)  | 22 Jul 84 | 23-03      |               |             |            | 1          | 1           |          | 1               |
| 111 | Stampede Cr.(M)  | 22 Jul 84 | 21-05      |               |             |            |            | 1           |          |                 |
| 112 | Stampede Cr.(M)  | 22 Jul 84 | 13-02      |               |             |            |            |             |          | 9               |
| 113 | Stampede Cr.(M)  | 11 Aug 84 | 30-03      |               |             |            |            | 1           |          |                 |
| 114 | Stampede Cr.(M)  | 11 Aug 84 | 02-04      |               |             |            |            |             |          | 4               |
| 115 | Stampede Cr.(M)  | 11 Aug 84 | 29-02      |               |             |            |            |             |          | 4               |
| 116 | Stampede Cr.(M)  | 11 Aug 84 | 22-03      |               |             |            |            | 2           |          | 1               |
| 117 | Stampede Cr.(M)  | 1 Sep 84  | 19-02      |               |             |            |            |             | 2        | 1               |
| 118 | Stampede Cr.(M)  | 1 Sep 84  | 21-04      |               |             |            |            |             |          | 4               |
| 119 | Stampede Cr.(M)  | 1 Sep 84  | 12-02      |               |             |            |            |             |          | 4               |
| 120 | Stampede Cr.(M)  | 1 Sep 84  | 18-08      |               |             |            |            |             | 3        | 7               |
| 121 | Stampede Cr.(M)  | 15 Sep 84 | 19-03      |               |             |            |            |             |          | 1               |
| 122 | Stampede Cr.(M)  | 15 Sep 84 | 21-02      |               |             |            |            |             |          |                 |
| 123 | Stampede Cr.(M)  | 15 Sep 84 | 13-04      |               |             |            | 1          |             | 1        |                 |
| 124 | Stampede Cr.(M)  | 15 Sep 84 | 03-03      |               |             |            |            | 1           | 1        | 5               |
| 125 | Jumbo Cr.(UM)    | 18 Jun 84 | 05-06      |               |             |            | 117        | 16          |          | 16              |
| 126 | Jumbo Cr.(UM)    | 18 Jun 84 | 07-08      |               |             | 1          | 87         |             |          |                 |
| 127 | Jumbo Cr.(UM)    | 18 Jun 84 | 03-01      |               |             | 1          | 255        | 16          |          | 10              |
| 128 | Jumbo Cr.(UM)    | 18 Jun 84 | 02-21      |               |             |            | 785        | 99          |          | 102             |
| 129 | Jumbo Cr.(UM)    | 2 Jul 84  | 27-04      |               |             |            | 1937       | 29          |          | 24              |
| 130 | Jumbo Cr.(UM)    | 2 Jul 84  | 08-02      |               |             |            | 596        | 23          |          |                 |
| 131 | Jumbo Cr.(UM)    | 2 Jul 84  | 30-05      |               |             |            | 803        | 15          |          | 23              |
| 132 | Jumbo Cr.(UM)    | 2 Jul 84  | 20-07      |               |             |            | 25         | 2           |          | 20              |
| 133 | Jumbo Cr.(UM)    | 21 Jul 84 | 29-03      |               |             |            | 499        | 41          |          | 76              |
| 134 | Jumbo Cr.(UM)    | 21 Jul 84 | 12-06      |               |             | 1          | 755        | 49          |          | 112             |
| 135 | Jumbo Cr.(UM)    | 21 Jul 84 | 09-02      |               |             |            | 616        | 14          |          | 67              |
| 136 | Jumbo Cr.(UM)    | 21 Jul 84 | 24-04      |               | 13          |            | 1186       | 57          |          | 88              |
| 137 | Jumbo Cr.(UM)    | 13 Aug 84 | 11-03      |               |             |            | 238        | 42          |          | 38              |
| 138 | Jumbo Cr.(UM)    | 13 Aug 84 | 06-03      |               | 1           |            | 47         | 3           |          |                 |
| 139 | Jumbo Cr.(UM)    | 13 Aug 84 | 04-03      |               |             |            | 447        | 35          | 2        | 116             |
| 140 | Jumbo Cr.(UM)    | 13 Aug 84 | 09-05      |               |             |            | 77         | 25          |          | 36              |
| 141 | Jumbo Cr.(UM)    | 3 Sep 84  | 14-03      |               |             |            | 20         | 10          |          | 6               |
| 142 | Jumbo Cr.(UM)    | 3 Sep 84  | 28-05      |               |             |            | 77         | 7           | 1        | 12              |
| 143 | Jumbo Cr.(UM)    | 3 Sep 84  | 11-13      |               |             |            | 184        | 13          |          | 78              |
| 144 | Jumbo Cr.(UM)    | 3 Sep 84  | 25-06      |               |             |            | 1135       | 62          |          | 194             |
| 145 | Jumbo Cr.(UM)    | 17 Sep 84 | 08-04      |               |             |            | 105        | 8           |          | 3               |
| 146 | Jumbo Cr.(UM)    | 17 Sep 84 | 12-03      |               |             |            | 144        | 14          |          |                 |
| 147 | Jumbo Cr.(UM)    | 17 Sep 84 | 07-10      |               |             |            | 11         | 2           |          | 4               |
| 148 | Jumbo Cr.(UM)    | 17 Sep 84 | 15-08      |               |             |            | 15         | 10          |          | 2               |
| 149 |                  |           |            |               |             |            |            |             |          |                 |
| 150 | GRAND TOTAL      |           |            | 23            | 3           | 1          | 23116      | 2085        | 162      | 3348            |
| 151 | BLDCOUNT         |           |            | 5             | 0           | 0          | 23         | 23          | 10       | 23              |
| 152 | ELDMXCOUNT       |           |            | 2             | 0           | 0          | 13         | 7           | 3        | 15              |
| 153 | SLATE(M) COUNT   |           |            | 1             | 0           | 1          | 5          | 3           | 1        | 10              |
| 154 | STAMPEDE COUNT   |           |            | 0             | 0           | 0          | 1          | 4           | 2        | 10              |
| 155 | STAMP(M) COUNT   |           |            | 0             | 0           | 0          | 4          | 6           | 5        | 13              |
| 156 | JUMBO COUNT      |           |            | 2             | 3           | 0          | 24         | 23          | 2        | 20              |

| 1  | 2                 | 3         | 4          | 5 | 6               | 7          | 8               | 9            | 10             | 11        |
|----|-------------------|-----------|------------|---|-----------------|------------|-----------------|--------------|----------------|-----------|
| 1  | STREAM            | DATE      | SAMPLE LOC |   | TOTAL ORGANISMS | Collembola | Diptera         | Diptera      | Diptera        | Diptera   |
| 2  |                   |           |            |   | SUMS            | Collembola | Ceratopogonidae | Chironomidae | Dolichopodidae | Empididae |
| 3  |                   |           |            |   |                 | TOTAL      | TOTAL           | TOTAL        | TOTAL          | TOTAL     |
| 4  |                   |           |            |   |                 |            |                 |              |                |           |
| 5  | Eldorado Cr. (UM) | 18 Jun 84 | 28-04      |   | 5217            | 2          |                 | 4468         |                | 0         |
| 6  | Eldorado Cr. (UM) | 18 Jun 84 | 02-02      |   | 1689            | 9          |                 | 1367         |                | 0         |
| 7  | Eldorado Cr. (UM) | 18 Jun 84 | 08-04      |   | 2524            |            |                 | 1318         |                | 1         |
| 8  | Eldorado Cr. (UM) | 18 Jun 84 | 04-05      |   | 1126            | 8          |                 | 1067         |                | 0         |
| 9  | Eldorado Cr. (UM) | 30 Jun 84 | 13-04      |   | 3989            |            |                 | 3648         |                | 0         |
| 10 | Eldorado Cr. (UM) | 30 Jun 84 | 08-04      |   | 2082            | 5          |                 | 990          |                | 0         |
| 11 | Eldorado Cr. (UM) | 30 Jun 84 | 01-00      |   | 7872            | 4          |                 | 6681         |                | 1         |
| 12 | Eldorado Cr. (UM) | 30 Jun 84 | 20-03      |   | 1868            | 1          |                 | 1743         |                | 1         |
| 13 | Eldorado Cr. (UM) | 23 Jul 84 | 30-09      |   | 2960            | 3          |                 | 1861         |                | 1         |
| 14 | Eldorado Cr. (UM) | 23 Jul 84 | 24-02      |   | 3949            | 3          |                 | 3610         |                | 0         |
| 15 | Eldorado Cr. (UM) | 23 Jul 84 | 05-04      |   | 8671            | 12         |                 | 7084         |                | 0         |
| 16 | Eldorado Cr. (UM) | 23 Jul 84 | 18-04      |   | 4068            | 5          |                 | 2835         |                | 1         |
| 17 | Eldorado Cr. (UM) | 12 Aug 84 | 12-01      |   | 6106            | 13         |                 | 4890         |                | 0         |
| 18 | Eldorado Cr. (UM) | 12 Aug 84 | 14-03      |   | 11372           | 5          |                 | 9499         |                | 5         |
| 19 | Eldorado Cr. (UM) | 12 Aug 84 | 26-02      |   | 6286            | 8          |                 | 4418         |                | 0         |
| 20 | Eldorado Cr. (UM) | 12 Aug 84 | 08-03      |   | 1066            | 2          |                 | 237          |                | 0         |
| 21 | Eldorado Cr. (UM) | 2 Sep 84  | 03-02      |   | 2648            | 13         |                 | 864          |                | 1         |
| 22 | Eldorado Cr. (UM) | 2 Sep 84  | 29-03      |   | 6555            | 6          |                 | 4642         |                | 2         |
| 23 | Eldorado Cr. (UM) | 2 Sep 84  | 21-01      |   | 5146            | 14         |                 | 3739         |                | 2         |
| 24 | Eldorado Cr. (UM) | 2 Sep 84  | 08-02      |   | 1893            | 6          |                 | 623          |                | 2         |
| 25 | Eldorado Cr. (UM) | 16 Sep 84 | 19-07      |   | 786             | 2          | 8               | 121          |                | 0         |
| 26 | Eldorado Cr. (UM) | 16 Sep 84 | 11-09      |   | 3661            | 4          |                 | 2149         |                | 2         |
| 27 | Eldorado Cr. (UM) | 16 Sep 84 | 06-02      |   | 1469            | 8          |                 | 192          |                | 0         |
| 28 | Eldorado Cr. (UM) | 16 Sep 84 | 02-02      |   | 3052            | 31         |                 | 1246         |                | 1         |
| 29 | Eldorado Cr. (M)  | 16 Jun 84 | 06-04      |   | 61              | 4          |                 | 33           |                | 2         |
| 30 | Eldorado Cr. (M)  | 16 Jun 84 | 12-04      |   | 14              | 1          |                 | 6            |                | 0         |
| 31 | Eldorado Cr. (M)  | 16 Jun 84 | 15-01      |   | 12              |            |                 | 2            |                | 0         |
| 32 | Eldorado Cr. (M)  | 16 Jun 84 | 23-01      |   | 17              | 3          |                 | 4            |                | 2         |
| 33 | Eldorado Cr. (M)  | 30 Jun 84 | 23-03      |   | 60              |            |                 | 38           |                | 0         |
| 34 | Eldorado Cr. (M)  | 30 Jun 84 | 00-02      |   | 41              |            |                 | 15           |                | 2         |
| 35 | Eldorado Cr. (M)  | 30 Jun 84 | 18-02      |   | 20              |            |                 | 11           |                | 0         |
| 36 | Eldorado Cr. (M)  | 30 Jun 84 | 05-04      |   | 18              | 2          |                 | 9            |                | 1         |
| 37 | Eldorado Cr. (M)  | 23 Jul 84 | 01-02      |   | 141             | 1          |                 | 92           |                | 1         |
| 38 | Eldorado Cr. (M)  | 23 Jul 84 | 02-04      |   | 210             | 2          |                 | 120          |                | 5         |
| 39 | Eldorado Cr. (M)  | 23 Jul 84 | 27-01      |   | 78              |            |                 | 45           |                | 9         |
| 40 | Eldorado Cr. (M)  | 23 Jul 84 | 01-04      |   | 61              | 2          |                 | 36           |                | 2         |
| 41 | Eldorado Cr. (M)  | 12 Aug 84 | 07-04      |   | 48              | 7          |                 | 16           |                | 1         |
| 42 | Eldorado Cr. (M)  | 12 Aug 84 | 13-01      |   | 60              | 2          |                 | 28           |                | 2         |
| 43 | Eldorado Cr. (M)  | 12 Aug 84 | 26-03      |   | 60              |            |                 | 28           |                | 7         |
| 44 | Eldorado Cr. (M)  | 12 Aug 84 | 10-01      |   | 57              | 3          |                 | 32           |                | 3         |
| 45 | Eldorado Cr. (M)  | 2 Sep 84  | 02-02      |   | 120             | 2          |                 | 28           |                | 4         |
| 46 | Eldorado Cr. (M)  | 2 Sep 84  | 08-03      |   | 38              | 4          |                 | 7            |                | 1         |
| 47 | Eldorado Cr. (M)  | 2 Sep 84  | 01-05      |   | 136             |            |                 | 57           |                | 3         |
| 48 | Eldorado Cr. (M)  | 2 Sep 84  | 13-02      |   | 111             |            |                 | 26           |                | 4         |
| 49 | Eldorado Cr. (M)  | 16 Sep 84 | 09-04      |   | 155             | 4          |                 | 35           |                | 7         |
| 50 | Eldorado Cr. (M)  | 16 Sep 84 | 18-02      |   | 199             | 2          |                 | 33           |                | 4         |
| 51 | Eldorado Cr. (M)  | 16 Sep 84 | 14-03      |   | 129             | 24         |                 | 23           |                | 1         |
| 52 | Eldorado Cr. (M)  | 16 Sep 84 | 17-04      |   | 46              |            |                 | 13           |                | 0         |
| 53 | Slate Cr. (M)     | 16 Jun 84 | 01-05      |   | 18              | 5          |                 | 5            |                | 2         |
| 54 | Slate Cr. (M)     | 16 Jun 84 | 25-05      |   | 27              | 7          |                 | 11           |                | 1         |
| 55 | Slate Cr. (M)     | 16 Jun 84 | 20-02      |   | 10              | 1          |                 | 8            |                | 0         |
| 56 | Slate Cr. (M)     | 16 Jun 84 | 23-02      |   | 17              | 1          |                 | 4            |                | 4         |
| 57 | Slate Cr. (M)     | 30 Jun 84 | 22-03      |   | 9               | 2          |                 | 3            |                | 0         |
| 58 | Slate Cr. (M)     | 30 Jun 84 | 25-01      |   | 34              | 1          |                 | 13           |                | 2         |
| 59 | Slate Cr. (M)     | 30 Jun 84 | 02-03      |   | 17              |            |                 | 3            |                | 4         |
| 60 | Slate Cr. (M)     | 30 Jun 84 | 14-02      |   | 19              |            |                 | 8            |                | 1         |
| 61 | Slate Cr. (M)     | 23 Jul 84 | 09-01      |   | 36              | 1          |                 | 31           |                | 2         |
| 62 | Slate Cr. (M)     | 23 Jul 84 | 28-02      |   | 217             |            |                 | 193          |                | 5         |
| 63 | Slate Cr. (M)     | 23 Jul 84 | 05-04      |   | 200             |            |                 | 163          |                | 8         |
| 64 | Slate Cr. (M)     | 23 Jul 84 | 11-00      |   | 12              | 1          |                 | 8            |                | 0         |
| 65 | Slate Cr. (M)     | 12 Aug 84 | 22-02      |   | 19              |            |                 | 16           |                | 0         |
| 66 | Slate Cr. (M)     | 12 Aug 84 | 24-03      |   | 53              | 1          |                 | 40           |                | 5         |
| 67 | Slate Cr. (M)     | 12 Aug 84 | 19-05      |   | 137             | 1          |                 | 118          |                | 0         |
| 68 | Slate Cr. (M)     | 12 Aug 84 | 01-01      |   | 17              | 1          |                 | 9            |                | 2         |
| 69 | Slate Cr. (M)     | 2 Sep 84  | 16-03      |   | 117             |            |                 | 55           |                | 6         |
| 70 | Slate Cr. (M)     | 2 Sep 84  | 07-02      |   | 50              | 5          |                 | 23           |                | 1         |
| 71 | Slate Cr. (M)     | 2 Sep 84  | 14-05      |   | 35              |            |                 | 7            |                | 3         |
| 72 | Slate Cr. (M)     | 2 Sep 84  | 09-02      |   | 45              | 1          |                 | 27           |                | 1         |
| 73 | Slate Cr. (M)     | 16 Sep 84 | 10-02      |   | 146             | 4          |                 | 30           |                | 3         |
| 74 | Slate Cr. (M)     | 16 Sep 84 | 03-03      |   | 141             | 4          |                 | 43           |                | 1         |
| 75 | Slate Cr. (M)     | 16 Sep 84 | 24-04      |   | 101             | 5          |                 | 12           |                | 3         |
| 76 | Slate Cr. (M)     | 16 Sep 84 | 23-02      |   | 67              | 2          |                 | 15           |                | 0         |
| 77 | Stampede Cr. (UM) | 17 Jun 84 | 00-02      |   | 34              |            |                 | 4            |                | 0         |
| 78 | Stampede Cr. (UM) | 17 Jun 84 | 09-00      |   | 10              | 1          |                 | 3            |                | 0         |
| 79 | Stampede Cr. (UM) | 17 Jun 84 | 02-05      |   | 49              |            |                 | 34           |                | 0         |
| 80 | Stampede Cr. (UM) | 17 Jun 84 | 06-02      |   | 7               |            |                 | 4            |                | 0         |
| 81 | Stampede Cr. (UM) | 1 Jul 84  | 08-00      |   | 111             | 3          |                 | 67           |                | 0         |
| 82 | Stampede Cr. (UM) | 1 Jul 84  | 08-03      |   | 260             | 1          |                 | 156          |                | 0         |
| 83 | Stampede Cr. (UM) | 1 Jul 84  | 00-01      |   | 40              |            |                 | 35           |                | 0         |
| 84 | Stampede Cr. (UM) | 1 Jul 84  | 29-04      |   | 348             |            |                 | 281          |                | 0         |
| 85 | Stampede Cr. (UM) | 22 Jul 84 | 23-02      |   | 296             | 5          |                 | 207          |                | 0         |
| 86 | Stampede Cr. (UM) | 22 Jul 84 | 00-04      |   | 98              | 2          |                 | 34           |                | 0         |
| 87 | Stampede Cr. (UM) | 22 Jul 84 | 05-00      |   | 119             |            |                 | 70           |                | 0         |
| 88 | Stampede Cr. (UM) | 22 Jul 84 | 10-00      |   | 140             |            |                 | 70           |                | 2         |
| 89 | Stampede Cr. (UM) | 11 Aug 84 | 23-04      |   | 181             |            |                 | 25           |                | 0         |
| 90 | Stampede Cr. (UM) | 11 Aug 84 | 22-01      |   | 157             |            |                 | 60           |                | 0         |
| 91 | Stampede Cr. (UM) | 11 Aug 84 | 01-01      |   | 164             | 9          |                 | 51           |                | 0         |
| 92 | Stampede Cr. (UM) | 11 Aug 84 | 02-04      |   | 93              | 2          |                 | 30           |                | 0         |
| 93 | Stampede Cr. (UM) | 1 Sep 84  | 17-04      |   | 114             |            |                 | 19           |                | 0         |
| 94 | Stampede Cr. (UM) | 1 Sep 84  | 28-04      |   | 165             | 1          |                 | 33           |                | 0         |
| 95 | Stampede Cr. (UM) | 1 Sep 84  | 12-02      |   | 212             |            |                 | 31           |                | 0         |
| 96 | Stampede Cr. (UM) | 1 Sep 84  | 22-03      |   | 168             |            |                 | 36           |                | 0         |
| 97 | Stampede Cr. (UM) | 15 Sep 84 | 08-01      |   | 128             | 3          |                 | 45           |                | 0         |
| 98 | Stampede Cr. (UM) | 15 Sep 84 | 13-04      |   | 66              | 1          |                 | 54           |                | 0         |

| 1   | 2                | 3         | 4          | 75 | 76              | 77         | 78              | 79           | 80          | 81       |
|-----|------------------|-----------|------------|----|-----------------|------------|-----------------|--------------|-------------|----------|
| 1   | STREAM           | DATE      | SAMPLE LOC |    | TOTAL ORGANISMS | Collembola | Diptera         | Diptera      | Diptera     | Diptera  |
| 2   |                  |           |            |    | SUMS            | Collembola | Ceratopogonidae | Chironomidae | Colechopoda | Empoidea |
| 3   |                  |           |            |    |                 | TOTAL      | TOTAL           | TOTAL        | TOTAL       | TOTAL    |
| 4   |                  |           |            |    |                 |            |                 |              |             |          |
| 99  | Stampede Cr (UM) | 15 Sep 84 | 30-03      |    | 181             |            |                 | 56           |             | 0        |
| 100 | Stampede Cr (UM) | 15 Sep 84 | 24-01      |    | 157             |            | 4               | 33           |             | 0        |
| 101 | Stampede Cr (M)  | 17 Jun 84 | 08-00      |    | 23              |            |                 | 9            |             | 0        |
| 102 | Stampede Cr (M)  | 17 Jun 84 | 22-00      |    | 9               |            |                 | 1            |             | 0        |
| 103 | Stampede Cr (M)  | 17 Jun 84 | 03-04      |    | 8               |            |                 | 1            |             | 0        |
| 104 | Stampede Cr (M)  | 17 Jun 84 | 00-03      |    | 6               |            |                 | 1            |             | 0        |
| 105 | Stampede Cr (M)  | 1 Jul 84  | 21-01      |    | 55              | 2          |                 | 36           |             | 0        |
| 106 | Stampede Cr (M)  | 1 Jul 84  | 00-02      |    | 105             |            |                 | 65           |             | 0        |
| 107 | Stampede Cr (M)  | 1 Jul 84  | 26-03      |    | 31              |            |                 | 14           |             | 0        |
| 108 | Stampede Cr (M)  | 1 Jul 84  | 06-04      |    | 6               |            |                 | 1            |             | 0        |
| 109 | Stampede Cr (M)  | 22 Jul 84 | 25-04      |    | 48              | 1          |                 | 25           |             | 0        |
| 110 | Stampede Cr (M)  | 22 Jul 84 | 23-03      |    | 71              |            |                 | 24           | 2           | 0        |
| 111 | Stampede Cr (M)  | 22 Jul 84 | 21-05      |    | 116             | 2          |                 | 66           |             | 0        |
| 112 | Stampede Cr (M)  | 22 Jul 84 | 13-02      |    | 70              | 1          |                 | 33           | 1           | 0        |
| 113 | Stampede Cr (M)  | 11 Aug 84 | 30-03      |    | 50              |            |                 | 22           |             | 0        |
| 114 | Stampede Cr (M)  | 11 Aug 84 | 02-04      |    | 204             | 1          |                 | 68           |             | 0        |
| 115 | Stampede Cr (M)  | 11 Aug 84 | 29-02      |    | 96              |            |                 | 35           |             | 0        |
| 116 | Stampede Cr (M)  | 11 Aug 84 | 22-03      |    | 152             | 2          |                 | 97           |             | 0        |
| 117 | Stampede Cr (M)  | 1 Sep 84  | 19-02      |    | 101             |            |                 | 47           |             | 0        |
| 118 | Stampede Cr (M)  | 1 Sep 84  | 21-04      |    | 123             |            |                 | 85           |             | 0        |
| 119 | Stampede Cr (M)  | 1 Sep 84  | 12-02      |    | 183             |            |                 | 90           |             | 0        |
| 120 | Stampede Cr (M)  | 1 Sep 84  | 18-06      |    | 89              |            |                 | 23           | 1           | 0        |
| 121 | Stampede Cr (M)  | 15 Sep 84 | 19-03      |    | 203             |            |                 | 125          |             | 0        |
| 122 | Stampede Cr (M)  | 15 Sep 84 | 21-02      |    | 51              |            |                 | 31           |             | 0        |
| 123 | Stampede Cr (M)  | 15 Sep 84 | 13-04      |    | 182             |            |                 | 120          | 1           | 0        |
| 124 | Stampede Cr (M)  | 15 Sep 84 | 03-03      |    | 137             |            |                 | 49           |             | 0        |
| 125 | Jumbo Cr (UM)    | 18 Jun 84 | 05-06      |    | 503             | 1          | 1               | 140          |             | 0        |
| 126 | Jumbo Cr (UM)    | 18 Jun 84 | 07-08      |    | 1841            |            |                 | 582          |             | 0        |
| 127 | Jumbo Cr (UM)    | 18 Jun 84 | 03-01      |    | 552             | 1          |                 | 141          |             | 0        |
| 128 | Jumbo Cr (UM)    | 18 Jun 84 | 02-21      |    | 2373            | 1          |                 | 330          |             | 1        |
| 129 | Jumbo Cr (UM)    | 2 Jul 84  | 27-04      |    | 2688            | 1          |                 | 498          |             | 0        |
| 130 | Jumbo Cr (UM)    | 2 Jul 84  | 06-02      |    | 1361            | 1          |                 | 341          |             | 0        |
| 131 | Jumbo Cr (UM)    | 2 Jul 84  | 30-05      |    | 1292            |            |                 | 222          |             | 2        |
| 132 | Jumbo Cr (UM)    | 2 Jul 84  | 20-07      |    | 438             | 1          |                 | 185          |             | 0        |
| 133 | Jumbo Cr (UM)    | 21 Jul 84 | 29-03      |    | 1345            |            |                 | 351          |             | 0        |
| 134 | Jumbo Cr (UM)    | 21 Jul 84 | 12-06      |    | 1619            | 2          |                 | 380          |             | 2        |
| 135 | Jumbo Cr (UM)    | 21 Jul 84 | 09-02      |    | 1273            | 5          |                 | 388          |             | 0        |
| 136 | Jumbo Cr (UM)    | 21 Jul 84 | 24-04      |    | 2351            |            |                 | 468          |             | 0        |
| 137 | Jumbo Cr (UM)    | 13 Aug 84 | 11-03      |    | 1593            | 2          |                 | 1074         |             | 2        |
| 138 | Jumbo Cr (UM)    | 13 Aug 84 | 06-03      |    | 377             |            |                 | 315          |             | 0        |
| 139 | Jumbo Cr (UM)    | 13 Aug 84 | 04-03      |    | 1200            |            |                 | 399          |             | 1        |
| 140 | Jumbo Cr (UM)    | 13 Aug 84 | 09-05      |    | 1148            | 7          |                 | 758          |             | 2        |
| 141 | Jumbo Cr (UM)    | 3 Sep 84  | 14-03      |    | 170             |            |                 | 106          |             | 0        |
| 142 | Jumbo Cr (UM)    | 3 Sep 84  | 28-05      |    | 571             | 1          |                 | 291          |             | 0        |
| 143 | Jumbo Cr (UM)    | 3 Sep 84  | 11-13      |    | 432             | 4          |                 | 1            |             | 0        |
| 144 | Jumbo Cr (UM)    | 3 Sep 84  | 25-06      |    | 2043            | 1          |                 | 208          |             | 2        |
| 145 | Jumbo Cr (UM)    | 17 Sep 84 | 06-04      |    | 599             | 4          |                 | 368          |             | 1        |
| 146 | Jumbo Cr (UM)    | 17 Sep 84 | 12-03      |    | 604             | 1          |                 | 376          |             | 0        |
| 147 | Jumbo Cr (UM)    | 17 Sep 84 | 07-10      |    | 96              |            |                 | 52           |             | 0        |
| 148 | Jumbo Cr (UM)    | 17 Sep 84 | 15-08      |    | 115             |            |                 | 62           |             | 0        |
| 149 |                  |           |            |    |                 |            |                 |              |             |          |
| 150 | GRAND TOTAL      |           |            | 0  |                 | 345        | 9               | 81416        | 5           | 151      |
| 151 | ELDOCOUNT        |           |            | 0  | 24              | 22         | 1               | 24           | 0           | 24       |
| 152 | ELDMYC COUNT     |           |            | 0  | 24              | 15         | 0               | 24           | 0           | 24       |
| 153 | SLATE(M) COUNT   |           |            | 0  | 24              | 17         | 0               | 24           | 0           | 24       |
| 154 | STAMPEDE COUNT   |           |            | 0  | 24              | 12         | 0               | 24           | 0           | 24       |
| 155 | STAMP(M) COUNT   |           |            | 0  | 24              | 6          | 0               | 24           | 4           | 24       |
| 156 | JUMBO COUNT      |           |            | 0  | 24              | 15         | 1               | 24           | 0           | 24       |



| 1      | 2                 | 3          | 4     | 82                              | 83                             | 84                                | 85                            | 86                            | 87                               | 88               |
|--------|-------------------|------------|-------|---------------------------------|--------------------------------|-----------------------------------|-------------------------------|-------------------------------|----------------------------------|------------------|
| STREAM | DATE              | SAMPLE LOC |       | Diptera<br>Psychodidae<br>TOTAL | Diptera<br>Simuliidae<br>TOTAL | Diptera<br>Stratiomyidae<br>TOTAL | Diptera<br>Tabanidae<br>TOTAL | Diptera<br>Tipulidae<br>TOTAL | Diptera<br>unidentified<br>TOTAL | Diptera<br>TOTAL |
| 1      |                   |            |       |                                 |                                |                                   |                               |                               |                                  |                  |
| 2      |                   |            |       |                                 |                                |                                   |                               |                               |                                  |                  |
| 3      |                   |            |       |                                 |                                |                                   |                               |                               |                                  |                  |
| 4      |                   |            |       |                                 |                                |                                   |                               |                               |                                  |                  |
| 5      | Eldorado Cr. (UM) | 16 Jun 84  | 26-04 |                                 |                                |                                   |                               | 1                             | 8                                | 4563             |
| 6      | Eldorado Cr. (UM) | 16 Jun 84  | 02-02 |                                 |                                |                                   |                               | 0                             | 0                                | 1367             |
| 7      | Eldorado Cr. (UM) | 16 Jun 84  | 06-04 |                                 |                                | 1                                 |                               | 1                             | 8                                | 1329             |
| 8      | Eldorado Cr. (UM) | 16 Jun 84  | 04-05 |                                 |                                |                                   |                               | 0                             | 0                                | 1071             |
| 9      | Eldorado Cr. (UM) | 30 Jun 84  | 13-04 |                                 |                                |                                   |                               | 0                             | 153                              | 3801             |
| 10     | Eldorado Cr. (UM) | 30 Jun 84  | 08-04 |                                 |                                |                                   |                               | 2                             | 23                               | 1015             |
| 11     | Eldorado Cr. (UM) | 30 Jun 84  | 01-00 |                                 |                                |                                   |                               | 1                             | 0                                | 6683             |
| 12     | Eldorado Cr. (UM) | 30 Jun 84  | 20-03 |                                 |                                |                                   |                               | 1                             | 0                                | 1745             |
| 13     | Eldorado Cr. (UM) | 23 Jul 84  | 30-09 |                                 |                                |                                   |                               | 3                             | 0                                | 1866             |
| 14     | Eldorado Cr. (UM) | 23 Jul 84  | 24-02 | 2                               |                                |                                   |                               | 0                             | 66                               | 3686             |
| 15     | Eldorado Cr. (UM) | 23 Jul 84  | 05-04 | 1                               |                                |                                   |                               | 2                             | 0                                | 7089             |
| 16     | Eldorado Cr. (UM) | 23 Jul 84  | 18-04 | 1                               |                                |                                   |                               | 0                             | 85                               | 2928             |
| 17     | Eldorado Cr. (UM) | 12 Aug 84  | 12-01 | 7                               |                                |                                   |                               | 4                             | 0                                | 4945             |
| 18     | Eldorado Cr. (UM) | 12 Aug 84  | 14-03 | 7                               |                                |                                   |                               | 6                             | 0                                | 9520             |
| 19     | Eldorado Cr. (UM) | 12 Aug 84  | 26-02 | 1                               |                                |                                   |                               | 7                             | 0                                | 4444             |
| 20     | Eldorado Cr. (UM) | 12 Aug 84  | 08-03 |                                 |                                |                                   |                               | 4                             | 12                               | 253              |
| 21     | Eldorado Cr. (UM) | 2 Sep 84   | 03-02 | 2                               |                                |                                   |                               | 23                            | 0                                | 889              |
| 22     | Eldorado Cr. (UM) | 2 Sep 84   | 29-03 | 1                               |                                |                                   |                               | 5                             | 4                                | 4673             |
| 23     | Eldorado Cr. (UM) | 2 Sep 84   | 21-01 | 4                               |                                |                                   |                               | 21                            | 1                                | 3880             |
| 24     | Eldorado Cr. (UM) | 2 Sep 84   | 08-02 |                                 |                                |                                   |                               | 12                            | 0                                | 638              |
| 25     | Eldorado Cr. (UM) | 16 Sep 84  | 19-07 |                                 |                                |                                   |                               | 4                             | 0                                | 133              |
| 26     | Eldorado Cr. (UM) | 16 Sep 84  | 11-09 |                                 | 3                              |                                   |                               | 21                            | 0                                | 2172             |
| 27     | Eldorado Cr. (UM) | 16 Sep 84  | 06-02 |                                 |                                |                                   |                               | 2                             | 1                                | 196              |
| 28     | Eldorado Cr. (UM) | 16 Sep 84  | 02-02 |                                 |                                |                                   |                               | 4                             | 0                                | 1252             |
| 29     | Eldorado Cr. (M)  | 16 Jun 84  | 06-04 |                                 |                                | 1                                 |                               | 0                             | 0                                | 37               |
| 30     | Eldorado Cr. (M)  | 16 Jun 84  | 12-04 |                                 |                                |                                   |                               | 0                             | 0                                | 6                |
| 31     | Eldorado Cr. (M)  | 16 Jun 84  | 15-01 |                                 |                                |                                   |                               | 0                             | 1                                | 3                |
| 32     | Eldorado Cr. (M)  | 16 Jun 84  | 23-01 |                                 |                                |                                   |                               | 0                             | 0                                | 6                |
| 33     | Eldorado Cr. (M)  | 30 Jun 84  | 23-03 |                                 |                                |                                   |                               | 1                             | 3                                | 43               |
| 34     | Eldorado Cr. (M)  | 30 Jun 84  | 00-02 |                                 |                                |                                   |                               | 0                             | 0                                | 18               |
| 35     | Eldorado Cr. (M)  | 30 Jun 84  | 18-02 |                                 |                                |                                   |                               | 0                             | 0                                | 12               |
| 36     | Eldorado Cr. (M)  | 30 Jun 84  | 05-04 |                                 |                                |                                   |                               | 0                             | 1                                | 11               |
| 37     | Eldorado Cr. (M)  | 23 Jul 84  | 01-02 |                                 |                                |                                   |                               | 1                             | 1                                | 97               |
| 38     | Eldorado Cr. (M)  | 23 Jul 84  | 02-04 |                                 |                                |                                   |                               | 1                             | 3                                | 129              |
| 39     | Eldorado Cr. (M)  | 23 Jul 84  | 27-01 |                                 |                                |                                   |                               | 1                             | 0                                | 59               |
| 40     | Eldorado Cr. (M)  | 23 Jul 84  | 01-04 |                                 |                                |                                   |                               | 1                             | 0                                | 39               |
| 41     | Eldorado Cr. (M)  | 12 Aug 84  | 07-04 | 2                               |                                |                                   |                               | 1                             | 0                                | 19               |
| 42     | Eldorado Cr. (M)  | 12 Aug 84  | 13-01 |                                 |                                |                                   |                               | 1                             | 0                                | 31               |
| 43     | Eldorado Cr. (M)  | 12 Aug 84  | 26-03 | 2                               |                                |                                   |                               | 0                             | 0                                | 38               |
| 44     | Eldorado Cr. (M)  | 12 Aug 84  | 10-01 |                                 |                                |                                   |                               | 0                             | 0                                | 35               |
| 45     | Eldorado Cr. (M)  | 2 Sep 84   | 02-02 | 1                               |                                |                                   |                               | 1                             | 0                                | 33               |
| 46     | Eldorado Cr. (M)  | 2 Sep 84   | 08-03 | 1                               |                                |                                   |                               | 0                             | 0                                | 8                |
| 47     | Eldorado Cr. (M)  | 2 Sep 84   | 01-05 | 3                               |                                |                                   |                               | 0                             | 0                                | 61               |
| 48     | Eldorado Cr. (M)  | 2 Sep 84   | 13-02 | 3                               |                                |                                   |                               | 2                             | 0                                | 32               |
| 49     | Eldorado Cr. (M)  | 16 Sep 84  | 09-04 | 1                               |                                |                                   |                               | 0                             | 0                                | 43               |
| 50     | Eldorado Cr. (M)  | 16 Sep 84  | 18-02 | 3                               |                                |                                   |                               | 1                             | 0                                | 45               |
| 51     | Eldorado Cr. (M)  | 16 Sep 84  | 14-03 |                                 |                                |                                   |                               | 1                             | 1                                | 27               |
| 52     | Eldorado Cr. (M)  | 16 Sep 84  | 17-04 |                                 |                                |                                   |                               | 0                             | 0                                | 13               |
| 53     | Slate Cr. (M)     | 16 Jun 84  | 01-05 |                                 |                                |                                   |                               | 0                             | 1                                | 8                |
| 54     | Slate Cr. (M)     | 16 Jun 84  | 25-05 |                                 |                                |                                   |                               | 0                             | 0                                | 12               |
| 55     | Slate Cr. (M)     | 16 Jun 84  | 20-02 |                                 |                                |                                   |                               | 0                             | 0                                | 8                |
| 56     | Slate Cr. (M)     | 16 Jun 84  | 23-02 |                                 |                                |                                   |                               | 0                             | 0                                | 8                |
| 57     | Slate Cr. (M)     | 30 Jun 84  | 22-03 |                                 |                                |                                   |                               | 0                             | 0                                | 3                |
| 58     | Slate Cr. (M)     | 30 Jun 84  | 25-01 |                                 |                                |                                   |                               | 0                             | 0                                | 19               |
| 59     | Slate Cr. (M)     | 30 Jun 84  | 02-03 |                                 |                                |                                   |                               | 0                             | 2                                | 11               |
| 60     | Slate Cr. (M)     | 30 Jun 84  | 14-02 |                                 |                                |                                   |                               | 0                             | 0                                | 11               |
| 61     | Slate Cr. (M)     | 23 Jul 84  | 09-01 |                                 |                                |                                   |                               | 0                             | 0                                | 33               |
| 62     | Slate Cr. (M)     | 23 Jul 84  | 28-02 |                                 |                                |                                   |                               | 3                             | 8                                | 210              |
| 63     | Slate Cr. (M)     | 23 Jul 84  | 05-04 |                                 |                                |                                   |                               | 0                             | 6                                | 186              |
| 64     | Slate Cr. (M)     | 23 Jul 84  | 11-00 |                                 |                                |                                   |                               | 0                             | 0                                | 8                |
| 65     | Slate Cr. (M)     | 12 Aug 84  | 22-02 | 1                               |                                |                                   |                               | 0                             | 1                                | 17               |
| 66     | Slate Cr. (M)     | 12 Aug 84  | 24-03 | 2                               |                                |                                   |                               | 0                             | 2                                | 47               |
| 67     | Slate Cr. (M)     | 12 Aug 84  | 19-05 | 1                               |                                |                                   |                               | 1                             | 5                                | 124              |
| 68     | Slate Cr. (M)     | 12 Aug 84  | 01-01 |                                 |                                |                                   |                               | 0                             | 3                                | 14               |
| 69     | Slate Cr. (M)     | 2 Sep 84   | 16-03 |                                 |                                |                                   |                               | 0                             | 4                                | 65               |
| 70     | Slate Cr. (M)     | 2 Sep 84   | 07-02 | 3                               |                                |                                   |                               | 1                             | 1                                | 26               |
| 71     | Slate Cr. (M)     | 2 Sep 84   | 14-05 | 3                               |                                |                                   |                               | 0                             | 0                                | 11               |
| 72     | Slate Cr. (M)     | 2 Sep 84   | 09-02 | 6                               |                                |                                   |                               | 0                             | 0                                | 28               |
| 73     | Slate Cr. (M)     | 16 Sep 84  | 10-02 | 3                               |                                |                                   |                               | 1                             | 0                                | 36               |
| 74     | Slate Cr. (M)     | 16 Sep 84  | 03-03 | 4                               |                                |                                   |                               | 0                             | 0                                | 48               |
| 75     | Slate Cr. (M)     | 16 Sep 84  | 24-04 | 2                               |                                |                                   |                               | 0                             | 0                                | 17               |
| 76     | Slate Cr. (M)     | 16 Sep 84  | 23-02 | 1                               |                                |                                   |                               | 0                             | 0                                | 15               |
| 77     | Stampede Cr. (UM) | 17 Jun 84  | 00-02 |                                 |                                |                                   |                               | 0                             | 0                                | 4                |
| 78     | Stampede Cr. (UM) | 17 Jun 84  | 09-00 |                                 |                                |                                   |                               | 0                             | 0                                | 3                |
| 79     | Stampede Cr. (UM) | 17 Jun 84  | 02-05 |                                 |                                |                                   |                               | 0                             | 0                                | 34               |
| 80     | Stampede Cr. (UM) | 17 Jun 84  | 06-02 |                                 |                                |                                   |                               | 0                             | 0                                | 4                |
| 81     | Stampede Cr. (UM) | 1 Jul 84   | 06-00 |                                 |                                |                                   |                               | 0                             | 0                                | 69               |
| 82     | Stampede Cr. (UM) | 1 Jul 84   | 08-03 |                                 | 1                              |                                   |                               | 0                             | 0                                | 157              |
| 83     | Stampede Cr. (UM) | 1 Jul 84   | 00-01 |                                 |                                |                                   |                               | 0                             | 0                                | 35               |
| 84     | Stampede Cr. (UM) | 1 Jul 84   | 29-04 |                                 |                                |                                   |                               | 2                             | 2                                | 286              |
| 85     | Stampede Cr. (UM) | 22 Jul 84  | 23-02 |                                 |                                |                                   |                               | 0                             | 0                                | 217              |
| 86     | Stampede Cr. (UM) | 22 Jul 84  | 00-04 |                                 |                                |                                   |                               | 0                             | 0                                | 38               |
| 87     | Stampede Cr. (UM) | 22 Jul 84  | 05-00 |                                 |                                |                                   |                               | 0                             | 0                                | 75               |
| 88     | Stampede Cr. (UM) | 22 Jul 84  | 30-00 |                                 |                                |                                   |                               | 3                             | 0                                | 79               |
| 89     | Stampede Cr. (UM) | 11 Aug 84  | 23-04 |                                 |                                |                                   |                               | 3                             | 0                                | 33               |
| 90     | Stampede Cr. (UM) | 11 Aug 84  | 22-01 |                                 |                                |                                   |                               | 0                             | 0                                | 88               |
| 91     | Stampede Cr. (UM) | 11 Aug 84  | 01-01 |                                 |                                |                                   |                               | 1                             | 4                                | 76               |
| 92     | Stampede Cr. (UM) | 11 Aug 84  | 02-04 |                                 |                                |                                   |                               | 0                             | 0                                | 31               |
| 93     | Stampede Cr. (UM) | 1 Sep 84   | 17-04 |                                 |                                |                                   |                               | 2                             | 0                                | 24               |
| 94     | Stampede Cr. (UM) | 1 Sep 84   | 28-04 |                                 | 1                              |                                   |                               | 4                             | 0                                | 39               |
| 95     | Stampede Cr. (UM) | 1 Sep 84   | 12-02 |                                 |                                |                                   |                               | 2                             | 0                                | 37               |
| 96     | Stampede Cr. (UM) | 1 Sep 84   | 22-03 |                                 |                                |                                   |                               | 0                             | 1                                | 42               |
| 97     | Stampede Cr. (UM) | 15 Sep 84  | 08-01 |                                 | 1                              |                                   |                               | 2                             | 1                                | 49               |
| 98     | Stampede Cr. (UM) | 15 Sep 84  | 13-04 |                                 |                                |                                   |                               | 0                             | 2                                | 58               |

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| 1  | 2                 | 3         | 4          | 89            | 90             | 91            | 92            | 93            | 94         | 95             |
|----|-------------------|-----------|------------|---------------|----------------|---------------|---------------|---------------|------------|----------------|
| 1  | STREAM            | DATE      | SAMPLE LOC | Ephemeroptera | Ephemeroptera  | Ephemeroptera | Ephemeroptera | Ephemeroptera | Plecoptera | Plecoptera     |
| 2  |                   |           |            | Baetidae      | Ephemerellidae | Heptageniidae | Siphonuridae  | TOTAL         | Capniidae  | Chloroperlidae |
| 3  |                   |           |            | TOTAL         | TOTAL          | TOTAL         | TOTAL         | TOTAL         | TOTAL      | TOTAL          |
| 4  |                   |           |            |               |                |               |               |               |            |                |
| 5  | Eldorado Cr. (UM) | 16 Jun 84 | 26-04      | 104           | 0              | 4             | 2             | 110           | 1          | 9              |
| 6  | Eldorado Cr. (UM) | 16 Jun 84 | 02-02      | 38            | 0              | 6             | 9             | 53            | 0          | 2              |
| 7  | Eldorado Cr. (UM) | 16 Jun 84 | 06-04      | 32            | 0              | 6             | 42            | 80            | 0          | 1              |
| 8  | Eldorado Cr. (UM) | 16 Jun 84 | 04-05      | 29            | 0              | 3             | 5             | 38            | 0          | 1              |
| 9  | Eldorado Cr. (UM) | 30 Jun 84 | 13-04      | 24            | 0              | 0             | 4             | 28            | 0          | 0              |
| 10 | Eldorado Cr. (UM) | 30 Jun 84 | 08-04      | 183           | 0              | 20            | 12            | 215           | 0          | 0              |
| 11 | Eldorado Cr. (UM) | 30 Jun 84 | 01-00      | 16            | 0              | 3             | 114           | 133           | 0          | 0              |
| 12 | Eldorado Cr. (UM) | 30 Jun 84 | 20-03      | 39            | 0              | 1             | 1             | 41            | 0          | 0              |
| 13 | Eldorado Cr. (UM) | 23 Jul 84 | 30-09      | 7             | 0              | 6             | 59            | 72            | 0          | 0              |
| 14 | Eldorado Cr. (UM) | 23 Jul 84 | 24-02      | 160           | 0              | 0             | 0             | 160           | 0          | 0              |
| 15 | Eldorado Cr. (UM) | 23 Jul 84 | 05-04      | 386           | 0              | 2             | 170           | 558           | 0          | 0              |
| 16 | Eldorado Cr. (UM) | 23 Jul 84 | 18-04      | 296           | 0              | 8             | 27            | 331           | 0          | 0              |
| 17 | Eldorado Cr. (UM) | 12 Aug 84 | 12-01      | 453           | 0              | 2             | 4             | 459           | 0          | 0              |
| 18 | Eldorado Cr. (UM) | 12 Aug 84 | 14-03      | 517           | 0              | 0             | 2             | 519           | 0          | 0              |
| 19 | Eldorado Cr. (UM) | 12 Aug 84 | 26-02      | 384           | 0              | 10            | 8             | 402           | 0          | 1              |
| 20 | Eldorado Cr. (UM) | 12 Aug 84 | 08-03      | 416           | 0              | 10            | 7             | 433           | 0          | 7              |
| 21 | Eldorado Cr. (UM) | 2 Sep 84  | 03-02      | 451           | 0              | 23            | 36            | 510           | 0          | 0              |
| 22 | Eldorado Cr. (UM) | 2 Sep 84  | 29-03      | 306           | 0              | 7             | 47            | 360           | 0          | 0              |
| 23 | Eldorado Cr. (UM) | 2 Sep 84  | 21-01      | 394           | 0              | 56            | 17            | 467           | 2          | 2              |
| 24 | Eldorado Cr. (UM) | 2 Sep 84  | 08-02      | 187           | 0              | 10            | 66            | 263           | 3          | 0              |
| 25 | Eldorado Cr. (UM) | 16 Sep 84 | 19-07      | 5             | 0              | 1             | 23            | 29            | 0          | 0              |
| 26 | Eldorado Cr. (UM) | 16 Sep 84 | 11-09      | 193           | 0              | 0             | 8             | 201           | 0          | 0              |
| 27 | Eldorado Cr. (UM) | 16 Sep 84 | 06-02      | 85            | 0              | 14            | 104           | 203           | 3          | 2              |
| 28 | Eldorado Cr. (UM) | 16 Sep 84 | 02-02      | 158           | 0              | 31            | 88            | 277           | 1          | 2              |
| 29 | Eldorado Cr. (M)  | 16 Jun 84 | 06-04      | 11            | 0              | 0             | 1             | 12            | 0          | 4              |
| 30 | Eldorado Cr. (M)  | 16 Jun 84 | 12-04      | 3             | 0              | 0             | 0             | 3             | 0          | 3              |
| 31 | Eldorado Cr. (M)  | 16 Jun 84 | 15-01      | 1             | 0              | 1             | 3             | 5             | 0          | 3              |
| 32 | Eldorado Cr. (M)  | 16 Jun 84 | 23-01      | 0             | 0              | 1             | 0             | 1             | 0          | 4              |
| 33 | Eldorado Cr. (M)  | 30 Jun 84 | 23-03      | 8             | 0              | 1             | 0             | 9             | 0          | 7              |
| 34 | Eldorado Cr. (M)  | 30 Jun 84 | 00-02      | 12            | 0              | 0             | 3             | 15            | 0          | 4              |
| 35 | Eldorado Cr. (M)  | 30 Jun 84 | 18-02      | 5             | 0              | 0             | 0             | 5             | 0          | 3              |
| 36 | Eldorado Cr. (M)  | 30 Jun 84 | 05-04      | 2             | 0              | 0             | 0             | 2             | 0          | 2              |
| 37 | Eldorado Cr. (M)  | 23 Jul 84 | 01-02      | 13            | 0              | 7             | 0             | 20            | 0          | 3              |
| 38 | Eldorado Cr. (M)  | 23 Jul 84 | 02-04      | 24            | 0              | 9             | 10            | 43            | 0          | 23             |
| 39 | Eldorado Cr. (M)  | 23 Jul 84 | 27-01      | 6             | 0              | 3             | 0             | 9             | 0          | 2              |
| 40 | Eldorado Cr. (M)  | 23 Jul 84 | 01-04      | 5             | 0              | 2             | 0             | 7             | 0          | 6              |
| 41 | Eldorado Cr. (M)  | 12 Aug 84 | 07-04      | 2             | 0              | 0             | 0             | 2             | 3          | 9              |
| 42 | Eldorado Cr. (M)  | 12 Aug 84 | 13-01      | 2             | 0              | 0             | 3             | 5             | 2          | 1              |
| 43 | Eldorado Cr. (M)  | 12 Aug 84 | 26-03      | 3             | 0              | 0             | 0             | 3             | 4          | 6              |
| 44 | Eldorado Cr. (M)  | 12 Aug 84 | 10-01      | 6             | 0              | 1             | 3             | 10            | 2          | 2              |
| 45 | Eldorado Cr. (M)  | 2 Sep 84  | 02-02      | 38            | 0              | 3             | 0             | 41            | 9          | 6              |
| 46 | Eldorado Cr. (M)  | 2 Sep 84  | 08-03      | 12            | 0              | 1             | 0             | 13            | 4          | 5              |
| 47 | Eldorado Cr. (M)  | 2 Sep 84  | 01-05      | 42            | 0              | 0             | 2             | 44            | 5          | 4              |
| 48 | Eldorado Cr. (M)  | 2 Sep 84  | 13-02      | 45            | 0              | 2             | 1             | 48            | 4          | 2              |
| 49 | Eldorado Cr. (M)  | 16 Sep 84 | 09-04      | 64            | 0              | 6             | 0             | 70            | 3          | 7              |
| 50 | Eldorado Cr. (M)  | 16 Sep 84 | 18-02      | 102           | 0              | 3             | 0             | 105           | 4          | 6              |
| 51 | Eldorado Cr. (M)  | 16 Sep 84 | 14-03      | 52            | 0              | 3             | 1             | 56            | 2          | 7              |
| 52 | Eldorado Cr. (M)  | 16 Sep 84 | 17-04      | 18            | 0              | 0             | 0             | 18            | 2          | 7              |
| 53 | Slate Cr. (M)     | 16 Jun 84 | 01-05      | 4             | 0              | 0             | 0             | 4             | 0          | 0              |
| 54 | Slate Cr. (M)     | 16 Jun 84 | 25-05      | 5             | 0              | 1             | 0             | 7             | 0          | 0              |
| 55 | Slate Cr. (M)     | 16 Jun 84 | 20-02      | 1             | 0              | 0             | 0             | 1             | 0          | 0              |
| 56 | Slate Cr. (M)     | 16 Jun 84 | 23-02      | 6             | 0              | 0             | 1             | 7             | 0          | 0              |
| 57 | Slate Cr. (M)     | 30 Jun 84 | 22-03      | 4             | 0              | 0             | 0             | 4             | 0          | 0              |
| 58 | Slate Cr. (M)     | 30 Jun 84 | 25-01      | 11            | 0              | 0             | 0             | 11            | 0          | 0              |
| 59 | Slate Cr. (M)     | 30 Jun 84 | 02-03      | 6             | 0              | 0             | 0             | 6             | 0          | 0              |
| 60 | Slate Cr. (M)     | 30 Jun 84 | 14-02      | 7             | 0              | 0             | 0             | 7             | 0          | 0              |
| 61 | Slate Cr. (M)     | 23 Jul 84 | 09-01      | 1             | 0              | 0             | 0             | 1             | 1          | 0              |
| 62 | Slate Cr. (M)     | 23 Jul 84 | 28-02      | 0             | 0              | 0             | 0             | 0             | 1          | 1              |
| 63 | Slate Cr. (M)     | 23 Jul 84 | 05-04      | 1             | 0              | 0             | 0             | 1             | 0          | 0              |
| 64 | Slate Cr. (M)     | 23 Jul 84 | 11-00      | 0             | 0              | 0             | 0             | 0             | 2          | 1              |
| 65 | Slate Cr. (M)     | 12 Aug 84 | 22-02      | 0             | 0              | 0             | 0             | 0             | 0          | 0              |
| 66 | Slate Cr. (M)     | 12 Aug 84 | 24-03      | 0             | 0              | 0             | 0             | 0             | 1          | 0              |
| 67 | Slate Cr. (M)     | 12 Aug 84 | 19-05      | 3             | 0              | 0             | 0             | 3             | 1          | 0              |
| 68 | Slate Cr. (M)     | 12 Aug 84 | 01-01      | 0             | 0              | 0             | 0             | 0             | 0          | 0              |
| 69 | Slate Cr. (M)     | 2 Sep 84  | 18-03      | 14            | 0              | 0             | 5             | 19            | 3          | 0              |
| 70 | Slate Cr. (M)     | 2 Sep 84  | 07-02      | 4             | 0              | 0             | 0             | 4             | 3          | 0              |
| 71 | Slate Cr. (M)     | 2 Sep 84  | 14-05      | 5             | 0              | 0             | 1             | 6             | 2          | 1              |
| 72 | Slate Cr. (M)     | 2 Sep 84  | 09-02      | 0             | 0              | 0             | 0             | 0             | 4          | 1              |
| 73 | Slate Cr. (M)     | 16 Sep 84 | 10-02      | 51            | 0              | 1             | 1             | 53            | 12         | 3              |
| 74 | Slate Cr. (M)     | 16 Sep 84 | 03-03      | 33            | 0              | 2             | 0             | 35            | 7          | 2              |
| 75 | Slate Cr. (M)     | 16 Sep 84 | 24-04      | 33            | 0              | 3             | 2             | 38            | 6          | 1              |
| 76 | Slate Cr. (M)     | 16 Sep 84 | 23-02      | 31            | 0              | 0             | 0             | 31            | 4          | 0              |
| 77 | Stampede Cr. (UM) | 17 Jun 84 | 00-02      | 0             | 0              | 0             | 1             | 1             | 0          | 0              |
| 78 | Stampede Cr. (UM) | 17 Jun 84 | 09-00      | 0             | 0              | 0             | 0             | 0             | 0          | 0              |
| 79 | Stampede Cr. (UM) | 17 Jun 84 | 02-05      | 0             | 0              | 0             | 0             | 0             | 0          | 1              |
| 80 | Stampede Cr. (UM) | 17 Jun 84 | 06-02      | 0             | 0              | 0             | 0             | 0             | 0          | 0              |
| 81 | Stampede Cr. (UM) | 1 Jul 84  | 06-00      | 1             | 0              | 0             | 1             | 2             | 4          | 1              |
| 82 | Stampede Cr. (UM) | 1 Jul 84  | 08-03      | 6             | 0              | 0             | 5             | 11            | 8          | 4              |
| 83 | Stampede Cr. (UM) | 1 Jul 84  | 00-01      | 0             | 0              | 0             | 0             | 0             | 2          | 0              |
| 84 | Stampede Cr. (UM) | 1 Jul 84  | 29-04      | 4             | 0              | 0             | 0             | 4             | 7          | 3              |
| 85 | Stampede Cr. (UM) | 22 Jul 84 | 23-02      | 0             | 0              | 0             | 4             | 4             | 49         | 0              |
| 86 | Stampede Cr. (UM) | 22 Jul 84 | 00-04      | 1             | 0              | 0             | 5             | 6             | 37         | 0              |
| 87 | Stampede Cr. (UM) | 22 Jul 84 | 05-00      | 0             | 0              | 0             | 0             | 0             | 30         | 1              |
| 88 | Stampede Cr. (UM) | 22 Jul 84 | 30-00      | 0             | 0              | 0             | 0             | 0             | 34         | 3              |
| 89 | Stampede Cr. (UM) | 11 Aug 84 | 23-04      | 2             | 0              | 0             | 0             | 2             | 114        | 14             |
| 90 | Stampede Cr. (UM) | 11 Aug 84 | 22-01      | 7             | 0              | 0             | 2             | 9             | 50         | 3              |
| 91 | Stampede Cr. (UM) | 11 Aug 84 | 01-01      | 10            | 0              | 0             | 0             | 12            | 43         | 0              |
| 92 | Stampede Cr. (UM) | 11 Aug 84 | 02-04      | 5             | 0              | 0             | 0             | 5             | 46         | 1              |
| 93 | Stampede Cr. (UM) | 1 Sep 84  | 17-04      | 1             | 0              | 0             | 2             | 3             | 78         | 0              |
| 94 | Stampede Cr. (UM) | 1 Sep 84  | 28-04      | 1             | 0              | 0             | 9             | 10            | 99         | 1              |
| 95 | Stampede Cr. (UM) | 1 Sep 84  | 12-02      | 0             | 0              | 0             | 9             | 9             | 107        | 4              |
| 96 | Stampede Cr. (UM) | 1 Sep 84  | 22-03      | 0             | 0              | 0             | 0             | 0             | 108        | 2              |
| 97 | Stampede Cr. (UM) | 15 Sep 84 | 08-01      | 0             | 0              | 0             | 18            | 18            | 43         | 2              |
| 98 | Stampede Cr. (UM) | 15 Sep 84 | 13-04      | 0             | 0              | 0             | 0             | 0             | 3          | 0              |



| 1   | 2                | 3         | 4          | 89                        | 90                              | 91                             | 92                            | 93                     | 94                      | 95                           |
|-----|------------------|-----------|------------|---------------------------|---------------------------------|--------------------------------|-------------------------------|------------------------|-------------------------|------------------------------|
| 1   | STREAM           | DATE      | SAMPLE LOC | Ephemeroptera<br>Baetidae | Ephemeroptera<br>Ephemerellidae | Ephemeroptera<br>Heptageniidae | Ephemeroptera<br>Siphonuridae | Ephemeroptera<br>TOTAL | Plecoptera<br>Capniidae | Plecoptera<br>Chloroperlidae |
| 2   |                  |           |            | TOTAL                     | TOTAL                           | TOTAL                          | TOTAL                         | TOTAL                  | TOTAL                   | TOTAL                        |
| 3   |                  |           |            |                           |                                 |                                |                               |                        |                         |                              |
| 4   |                  |           |            |                           |                                 |                                |                               |                        |                         |                              |
| 99  | Stampede Cr.(UM) | 15 Sep 84 | 30-03      | 0                         | 0                               | 0                              | 6                             | 6                      | 80                      | 13                           |
| 100 | Stampede Cr.(UM) | 15 Sep 84 | 24-01      | 0                         | 0                               | 0                              | 7                             | 7                      | 62                      | 9                            |
| 101 | Stampede Cr.(M)  | 17 Jun 84 | 08-00      | 0                         | 0                               | 0                              | 0                             | 0                      | 1                       | 0                            |
| 102 | Stampede Cr.(M)  | 17 Jun 84 | 22-00      | 0                         | 0                               | 0                              | 0                             | 0                      | 0                       | 0                            |
| 103 | Stampede Cr.(M)  | 17 Jun 84 | 03-04      | 0                         | 0                               | 0                              | 0                             | 0                      | 1                       | 0                            |
| 104 | Stampede Cr.(M)  | 17 Jun 84 | 00-03      | 0                         | 0                               | 0                              | 0                             | 0                      | 1                       | 0                            |
| 105 | Stampede Cr.(M)  | 1 Jul 84  | 21-01      | 0                         | 0                               | 0                              | 0                             | 0                      | 6                       | 0                            |
| 106 | Stampede Cr.(M)  | 1 Jul 84  | 00-02      | 0                         | 0                               | 0                              | 0                             | 0                      | 8                       | 1                            |
| 107 | Stampede Cr.(M)  | 1 Jul 84  | 26-03      | 0                         | 0                               | 0                              | 1                             | 1                      | 2                       | 0                            |
| 108 | Stampede Cr.(M)  | 1 Jul 84  | 06-04      | 0                         | 0                               | 0                              | 0                             | 0                      | 2                       | 0                            |
| 109 | Stampede Cr.(M)  | 22 Jul 84 | 25-04      | 1                         | 0                               | 0                              | 2                             | 3                      | 6                       | 0                            |
| 110 | Stampede Cr.(M)  | 22 Jul 84 | 23-03      | 0                         | 0                               | 0                              | 0                             | 0                      | 19                      | 0                            |
| 111 | Stampede Cr.(M)  | 22 Jul 84 | 21-05      | 0                         | 0                               | 0                              | 0                             | 0                      | 17                      | 0                            |
| 112 | Stampede Cr.(M)  | 22 Jul 84 | 13-02      | 0                         | 0                               | 0                              | 1                             | 1                      | 13                      | 0                            |
| 113 | Stampede Cr.(M)  | 11 Aug 84 | 30-03      | 4                         | 0                               | 0                              | 0                             | 4                      | 10                      | 0                            |
| 114 | Stampede Cr.(M)  | 11 Aug 84 | 02-04      | 12                        | 0                               | 0                              | 2                             | 14                     | 70                      | 1                            |
| 115 | Stampede Cr.(M)  | 11 Aug 84 | 29-02      | 1                         | 0                               | 0                              | 2                             | 3                      | 42                      | 0                            |
| 116 | Stampede Cr.(M)  | 11 Aug 84 | 22-03      | 4                         | 0                               | 0                              | 0                             | 4                      | 30                      | 0                            |
| 117 | Stampede Cr.(M)  | 1 Sep 84  | 19-02      | 0                         | 0                               | 0                              | 0                             | 0                      | 25                      | 1                            |
| 118 | Stampede Cr.(M)  | 1 Sep 84  | 21-04      | 0                         | 0                               | 0                              | 0                             | 0                      | 26                      | 0                            |
| 119 | Stampede Cr.(M)  | 1 Sep 84  | 12-02      | 1                         | 0                               | 0                              | 0                             | 1                      | 64                      | 1                            |
| 120 | Stampede Cr.(M)  | 1 Sep 84  | 18-06      | 0                         | 0                               | 0                              | 9                             | 9                      | 24                      | 0                            |
| 121 | Stampede Cr.(M)  | 15 Sep 84 | 19-03      | 0                         | 0                               | 0                              | 0                             | 0                      | 42                      | 0                            |
| 122 | Stampede Cr.(M)  | 15 Sep 84 | 21-02      | 0                         | 0                               | 0                              | 0                             | 0                      | 12                      | 0                            |
| 123 | Stampede Cr.(M)  | 15 Sep 84 | 13-04      | 0                         | 0                               | 0                              | 0                             | 0                      | 31                      | 0                            |
| 124 | Stampede Cr.(M)  | 15 Sep 84 | 03-03      | 0                         | 0                               | 0                              | 0                             | 0                      | 54                      | 0                            |
| 125 | Jumbo Cr.(UM)    | 18 Jun 84 | 05-06      | 76                        | 0                               | 64                             | 3                             | 143                    | 0                       | 14                           |
| 126 | Jumbo Cr.(UM)    | 18 Jun 84 | 07-08      | 662                       | 2                               | 249                            | 32                            | 945                    | 2                       | 17                           |
| 127 | Jumbo Cr.(UM)    | 18 Jun 84 | 03-01      | 101                       | 0                               | 83                             | 12                            | 196                    | 0                       | 1                            |
| 128 | Jumbo Cr.(UM)    | 18 Jun 84 | 02-21      | 355                       | 0                               | 458                            | 24                            | 837                    | 0                       | 54                           |
| 129 | Jumbo Cr.(UM)    | 2 Jul 84  | 27-04      | 40                        | 0                               | 69                             | 62                            | 171                    | 0                       | 13                           |
| 130 | Jumbo Cr.(UM)    | 2 Jul 84  | 06-02      | 211                       | 0                               | 77                             | 14                            | 302                    | 0                       | 5                            |
| 131 | Jumbo Cr.(UM)    | 2 Jul 84  | 30-05      | 62                        | 0                               | 64                             | 43                            | 169                    | 0                       | 8                            |
| 132 | Jumbo Cr.(UM)    | 2 Jul 84  | 20-07      | 89                        | 0                               | 34                             | 2                             | 125                    | 0                       | 5                            |
| 133 | Jumbo Cr.(UM)    | 21 Jul 84 | 29-03      | 91                        | 0                               | 109                            | 92                            | 292                    | 0                       | 7                            |
| 134 | Jumbo Cr.(UM)    | 21 Jul 84 | 12-06      | 58                        | 3                               | 49                             | 134                           | 244                    | 3                       | 7                            |
| 135 | Jumbo Cr.(UM)    | 21 Jul 84 | 09-02      | 104                       | 0                               | 29                             | 20                            | 153                    | 2                       | 0                            |
| 136 | Jumbo Cr.(UM)    | 21 Jul 84 | 24-04      | 56                        | 0                               | 42                             | 306                           | 405                    | 3                       | 5                            |
| 137 | Jumbo Cr.(UM)    | 13 Aug 84 | 11-03      | 31                        | 0                               | 30                             | 9                             | 70                     | 3                       | 5                            |
| 138 | Jumbo Cr.(UM)    | 13 Aug 84 | 06-03      | 4                         | 0                               | 3                              | 0                             | 8                      | 0                       | 0                            |
| 139 | Jumbo Cr.(UM)    | 13 Aug 84 | 04-03      | 40                        | 12                              | 42                             | 8                             | 102                    | 14                      | 18                           |
| 140 | Jumbo Cr.(UM)    | 13 Aug 84 | 09-05      | 66                        | 11                              | 40                             | 13                            | 130                    | 6                       | 7                            |
| 141 | Jumbo Cr.(UM)    | 3 Sep 84  | 14-03      | 5                         | 1                               | 2                              | 5                             | 13                     | 0                       | 0                            |
| 142 | Jumbo Cr.(UM)    | 3 Sep 84  | 28-05      | 15                        | 25                              | 27                             | 13                            | 80                     | 5                       | 9                            |
| 143 | Jumbo Cr.(UM)    | 3 Sep 84  | 11-13      | 17                        | 20                              | 11                             | 18                            | 66                     | 9                       | 11                           |
| 144 | Jumbo Cr.(UM)    | 3 Sep 84  | 25-06      | 6                         | 4                               | 30                             | 259                           | 299                    | 42                      | 11                           |
| 145 | Jumbo Cr.(UM)    | 17 Sep 84 | 06-04      | 8                         | 12                              | 15                             | 11                            | 46                     | 19                      | 2                            |
| 146 | Jumbo Cr.(UM)    | 17 Sep 84 | 12-03      | 2                         | 13                              | 1                              | 9                             | 25                     | 1                       | 8                            |
| 147 | Jumbo Cr.(UM)    | 17 Sep 84 | 07-10      | 1                         | 0                               | 4                              | 1                             | 6                      | 0                       | 0                            |
| 148 | Jumbo Cr.(UM)    | 17 Sep 84 | 15-08      | 0                         | 3                               | 4                              | 3                             | 10                     | 0                       | 0                            |
| 149 |                  |           |            |                           |                                 |                                |                               |                        |                         |                              |
| 150 | GRAND TOTAL      |           |            | 7731                      |                                 | 1809                           | 2074                          |                        | 1721                    | 436                          |
| 151 | ELDCOUNT         |           |            | 24                        | 24                              | 24                             | 24                            | 24                     | 24                      | 24                           |
| 152 | ELDXICOUNT       |           |            | 24                        | 24                              | 24                             | 24                            | 24                     | 24                      | 24                           |
| 153 | SLATE(M) COUNT   |           |            | 24                        | 24                              | 24                             | 24                            | 24                     | 24                      | 24                           |
| 154 | STAMPEDE COUNT   |           |            | 24                        | 24                              | 24                             | 24                            | 24                     | 24                      | 24                           |
| 155 | STAMPI(M) COUNT  |           |            | 24                        | 24                              | 24                             | 24                            | 24                     | 24                      | 24                           |
| 156 | JUMBO COUNT      |           |            | 24                        | 24                              | 24                             | 24                            | 24                     | 24                      | 24                           |

| 1  | 2                 | 3         | 4           | 96                                | 97                                | 98                              | 99                                    | 100                                     | 101                 | 102                                   |
|----|-------------------|-----------|-------------|-----------------------------------|-----------------------------------|---------------------------------|---------------------------------------|---|---------------------|---------------------------------------|
| 1  | STREAM            | DATE      | SAMPLE LOC. | Plecoptera<br>Leuctridae<br>TOTAL | Plecoptera<br>Nemouridae<br>TOTAL | Plecoptera<br>Perlidae<br>TOTAL | Plecoptera<br>Pseudoperlidae<br>TOTAL | Plecoptera<br>Taeniopterygidae<br>TOTAL | Plecoptera<br>TOTAL | Trichoptera<br>Limnephilidae<br>TOTAL |
| 5  | Eldorado Cr. (UM) | 16 Jun 84 | 26-04       | 0                                 | 254                               |                                 | 3                                     | 0                                       | 267                 | 0                                     |
| 6  | Eldorado Cr. (UM) | 16 Jun 84 | 02-02       | 0                                 | 56                                |                                 | 0                                     | 0                                       | 56                  | 1                                     |
| 7  | Eldorado Cr. (UM) | 16 Jun 84 | 06-04       | 0                                 | 42                                |                                 | 1                                     | 0                                       | 44                  | 0                                     |
| 8  | Eldorado Cr. (UM) | 16 Jun 84 | 04-05       | 0                                 | 4                                 |                                 | 0                                     | 0                                       | 5                   | 0                                     |
| 9  | Eldorado Cr. (UM) | 30 Jun 84 | 13-04       | 0                                 | 24                                |                                 | 0                                     | 0                                       | 24                  | 0                                     |
| 10 | Eldorado Cr. (UM) | 30 Jun 84 | 08-04       | 0                                 | 35                                |                                 | 5                                     | 0                                       | 40                  | 0                                     |
| 11 | Eldorado Cr. (UM) | 30 Jun 84 | 01-00       | 0                                 | 151                               |                                 | 4                                     | 0                                       | 157                 | 2                                     |
| 12 | Eldorado Cr. (UM) | 30 Jun 84 | 20-03       | 0                                 | 52                                |                                 | 2                                     | 0                                       | 54                  | 1                                     |
| 13 | Eldorado Cr. (UM) | 23 Jul 84 | 30-09       | 0                                 | 36                                |                                 | 3                                     | 0                                       | 39                  | 2                                     |
| 14 | Eldorado Cr. (UM) | 23 Jul 84 | 24-02       | 0                                 | 29                                |                                 | 0                                     | 0                                       | 29                  | 0                                     |
| 15 | Eldorado Cr. (UM) | 23 Jul 84 | 05-04       | 0                                 | 288                               |                                 | 3                                     | 0                                       | 291                 | 15                                    |
| 16 | Eldorado Cr. (UM) | 23 Jul 84 | 18-04       | 0                                 | 221                               |                                 | 2                                     | 0                                       | 223                 | 1                                     |
| 17 | Eldorado Cr. (UM) | 12 Aug 84 | 12-01       | 0                                 | 132                               |                                 | 1                                     | 0                                       | 133                 | 0                                     |
| 18 | Eldorado Cr. (UM) | 12 Aug 84 | 14-03       | 0                                 | 259                               |                                 | 0                                     | 0                                       | 259                 | 5                                     |
| 19 | Eldorado Cr. (UM) | 12 Aug 84 | 26-02       | 0                                 | 213                               |                                 | 0                                     | 0                                       | 213                 | 0                                     |
| 20 | Eldorado Cr. (UM) | 12 Aug 84 | 08-03       | 0                                 | 45                                |                                 | 1                                     | 0                                       | 46                  | 10                                    |
| 21 | Eldorado Cr. (UM) | 2 Sep 84  | 03-02       | 0                                 | 152                               |                                 | 7                                     | 0                                       | 159                 | 2                                     |
| 22 | Eldorado Cr. (UM) | 2 Sep 84  | 29-03       | 0                                 | 217                               |                                 | 0                                     | 0                                       | 217                 | 0                                     |
| 23 | Eldorado Cr. (UM) | 2 Sep 84  | 21-01       | 0                                 | 225                               |                                 | 2                                     | 0                                       | 227                 | 9                                     |
| 24 | Eldorado Cr. (UM) | 2 Sep 84  | 08-02       | 0                                 | 151                               |                                 | 0                                     | 0                                       | 151                 | 0                                     |
| 25 | Eldorado Cr. (UM) | 16 Sep 84 | 19-07       | 0                                 | 2                                 |                                 | 0                                     | 0                                       | 2                   | 0                                     |
| 26 | Eldorado Cr. (UM) | 16 Sep 84 | 11-1-09     | 0                                 | 220                               |                                 | 0                                     | 0                                       | 220                 | 5                                     |
| 27 | Eldorado Cr. (UM) | 16 Sep 84 | 06-02       | 0                                 | 50                                |                                 | 5                                     | 0                                       | 55                  | 0                                     |
| 28 | Eldorado Cr. (UM) | 16 Sep 84 | 02-02       | 0                                 | 104                               |                                 | 27                                    | 0                                       | 131                 | 10                                    |
| 29 | Eldorado Cr. (M)  | 16 Jun 84 | 06-04       | 0                                 | 4                                 |                                 | 0                                     | 0                                       | 4                   | 0                                     |
| 30 | Eldorado Cr. (M)  | 16 Jun 84 | 12-04       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 31 | Eldorado Cr. (M)  | 16 Jun 84 | 15-01       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 32 | Eldorado Cr. (M)  | 16 Jun 84 | 23-01       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 33 | Eldorado Cr. (M)  | 30 Jun 84 | 23-03       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 34 | Eldorado Cr. (M)  | 30 Jun 84 | 00-02       | 0                                 | 3                                 |                                 | 0                                     | 0                                       | 3                   | 0                                     |
| 35 | Eldorado Cr. (M)  | 30 Jun 84 | 18-02       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 36 | Eldorado Cr. (M)  | 30 Jun 84 | 05-04       | 0                                 | 0                                 |                                 | 1                                     | 0                                       | 1                   | 0                                     |
| 37 | Eldorado Cr. (M)  | 23 Jul 84 | 01-02       | 0                                 | 10                                |                                 | 0                                     | 0                                       | 10                  | 0                                     |
| 38 | Eldorado Cr. (M)  | 23 Jul 84 | 02-04       | 0                                 | 6                                 |                                 | 0                                     | 0                                       | 6                   | 0                                     |
| 39 | Eldorado Cr. (M)  | 23 Jul 84 | 27-01       | 0                                 | 5                                 |                                 | 0                                     | 0                                       | 5                   | 0                                     |
| 40 | Eldorado Cr. (M)  | 23 Jul 84 | 01-04       | 0                                 | 2                                 |                                 | 0                                     | 0                                       | 2                   | 0                                     |
| 41 | Eldorado Cr. (M)  | 12 Aug 84 | 07-04       | 0                                 | 0                                 |                                 | 2                                     | 0                                       | 2                   | 0                                     |
| 42 | Eldorado Cr. (M)  | 12 Aug 84 | 13-01       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 1                                     |
| 43 | Eldorado Cr. (M)  | 12 Aug 84 | 26-03       | 0                                 | 3                                 |                                 | 0                                     | 0                                       | 3                   | 1                                     |
| 44 | Eldorado Cr. (M)  | 12 Aug 84 | 10-01       | 0                                 | 4                                 |                                 | 0                                     | 0                                       | 4                   | 0                                     |
| 45 | Eldorado Cr. (M)  | 2 Sep 84  | 02-02       | 0                                 | 20                                |                                 | 0                                     | 0                                       | 20                  | 0                                     |
| 46 | Eldorado Cr. (M)  | 2 Sep 84  | 08-03       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 47 | Eldorado Cr. (M)  | 2 Sep 84  | 01-05       | 0                                 | 5                                 |                                 | 0                                     | 12                                      | 17                  | 0                                     |
| 48 | Eldorado Cr. (M)  | 2 Sep 84  | 13-02       | 0                                 | 5                                 |                                 | 0                                     | 0                                       | 5                   | 1                                     |
| 49 | Eldorado Cr. (M)  | 16 Sep 84 | 09-04       | 0                                 | 18                                |                                 | 0                                     | 0                                       | 18                  | 0                                     |
| 50 | Eldorado Cr. (M)  | 16 Sep 84 | 18-02       | 0                                 | 18                                |                                 | 0                                     | 0                                       | 18                  | 0                                     |
| 51 | Eldorado Cr. (M)  | 16 Sep 84 | 14-03       | 0                                 | 8                                 |                                 | 0                                     | 0                                       | 8                   | 1                                     |
| 52 | Eldorado Cr. (M)  | 16 Sep 84 | 17-04       | 0                                 | 4                                 |                                 | 0                                     | 0                                       | 4                   | 0                                     |
| 53 | Slate Cr. (M)     | 16 Jun 84 | 01-05       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 54 | Slate Cr. (M)     | 16 Jun 84 | 25-05       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 55 | Slate Cr. (M)     | 16 Jun 84 | 20-02       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 56 | Slate Cr. (M)     | 16 Jun 84 | 23-02       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 57 | Slate Cr. (M)     | 30 Jun 84 | 22-03       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 58 | Slate Cr. (M)     | 30 Jun 84 | 25-01       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 59 | Slate Cr. (M)     | 30 Jun 84 | 02-03       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 60 | Slate Cr. (M)     | 30 Jun 84 | 14-02       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 61 | Slate Cr. (M)     | 23 Jul 84 | 09-01       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 62 | Slate Cr. (M)     | 23 Jul 84 | 28-02       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 63 | Slate Cr. (M)     | 23 Jul 84 | 05-04       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 64 | Slate Cr. (M)     | 23 Jul 84 | 11-00       | 0                                 | 0                                 |                                 | 0                                     | 0                                       | 0                   | 0                                     |
| 65 | Slate Cr. (M)     | 12 Aug 84 | 22-02       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 66 | Slate Cr. (M)     | 12 Aug 84 | 24-03       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 67 | Slate Cr. (M)     | 12 Aug 84 | 19-05       | 0                                 | 0                                 |                                 | 8                                     | 0                                       | 8                   | 0                                     |
| 68 | Slate Cr. (M)     | 12 Aug 84 | 01-01       | 0                                 | 1                                 |                                 | 0                                     | 0                                       | 1                   | 0                                     |
| 69 | Slate Cr. (M)     | 2 Sep 84  | 16-03       | 0                                 | 24                                |                                 | 0                                     | 0                                       | 24                  | 1                                     |
| 70 | Slate Cr. (M)     | 2 Sep 84  | 07-02       | 0                                 | 10                                |                                 | 0                                     | 0                                       | 10                  | 0                                     |
| 71 | Slate Cr. (M)     | 2 Sep 84  | 14-05       | 0                                 | 8                                 |                                 | 0                                     | 5                                       | 13                  | 1                                     |
| 72 | Slate Cr. (M)     | 2 Sep 84  | 09-02       | 0                                 | 11                                |                                 | 0                                     | 0                                       | 11                  | 0                                     |
| 73 | Slate Cr. (M)     | 16 Sep 84 | 10-02       | 0                                 | 34                                |                                 | 0                                     | 0                                       | 34                  | 0                                     |
| 74 | Slate Cr. (M)     | 16 Sep 84 | 03-03       | 0                                 | 41                                |                                 | 0                                     | 0                                       | 41                  | 0                                     |
| 75 | Slate Cr. (M)     | 16 Sep 84 | 24-04       | 0                                 | 30                                |                                 | 0                                     | 0                                       | 30                  | 0                                     |
| 76 | Slate Cr. (M)     | 16 Sep 84 | 23-02       | 0                                 | 14                                |                                 | 0                                     | 0                                       | 14                  | 0                                     |
| 77 | Stampede Cr. (UM) | 17 Jun 84 | 00-02       | 0                                 | 27                                |                                 | 0                                     | 0                                       | 27                  | 0                                     |
| 78 | Stampede Cr. (UM) | 17 Jun 84 | 09-00       | 0                                 | 14                                |                                 | 0                                     | 0                                       | 14                  | 0                                     |
| 79 | Stampede Cr. (UM) | 17 Jun 84 | 02-05       | 0                                 | 3                                 |                                 | 0                                     | 0                                       | 3                   | 0                                     |
| 80 | Stampede Cr. (UM) | 17 Jun 84 | 06-02       | 0                                 | 3                                 |                                 | 0                                     | 0                                       | 3                   | 0                                     |
| 81 | Stampede Cr. (UM) | 1 Jul 84  | 06-00       | 0                                 | 30                                |                                 | 0                                     | 0                                       | 30                  | 0                                     |
| 82 | Stampede Cr. (UM) | 1 Jul 84  | 08-03       | 0                                 | 73                                |                                 | 0                                     | 0                                       | 73                  | 0                                     |
| 83 | Stampede Cr. (UM) | 1 Jul 84  | 00-01       | 0                                 | 3                                 |                                 | 0                                     | 0                                       | 3                   | 0                                     |
| 84 | Stampede Cr. (UM) | 1 Jul 84  | 29-04       | 0                                 | 47                                |                                 | 1                                     | 0                                       | 48                  | 0                                     |
| 85 | Stampede Cr. (UM) | 22 Jul 84 | 23-02       | 0                                 | 18                                |                                 | 0                                     | 2                                       | 20                  | 0                                     |
| 86 | Stampede Cr. (UM) | 22 Jul 84 | 00-04       | 0                                 | 14                                |                                 | 0                                     | 0                                       | 14                  | 0                                     |
| 87 | Stampede Cr. (UM) | 22 Jul 84 | 05-00       | 0                                 | 12                                |                                 | 0                                     | 0                                       | 12                  | 0                                     |
| 88 | Stampede Cr. (UM) | 22 Jul 84 | 30-00       | 0                                 | 24                                |                                 | 0                                     | 0                                       | 24                  | 0                                     |
| 89 | Stampede Cr. (UM) | 11 Aug 84 | 23-04       | 0                                 | 6                                 |                                 | 11                                    | 0                                       | 17                  | 0                                     |
| 90 | Stampede Cr. (UM) | 11 Aug 84 | 22-01       | 0                                 | 5                                 |                                 | 0                                     | 0                                       | 5                   | 0                                     |
| 91 | Stampede Cr. (UM) | 11 Aug 84 | 01-01       | 0                                 | 14                                |                                 | 0                                     | 3                                       | 17                  | 0                                     |
| 92 | Stampede Cr. (UM) | 11 Aug 84 | 02-04       | 0                                 | 6                                 |                                 | 1                                     | 1                                       | 8                   | 0                                     |
| 93 | Stampede Cr. (UM) | 1 Sep 84  | 17-04       | 0                                 | 7                                 |                                 | 2                                     | 0                                       | 9                   | 0                                     |
| 94 | Stampede Cr. (UM) | 1 Sep 84  | 28-04       | 0                                 | 5                                 |                                 | 3                                     | 0                                       | 8                   | 0                                     |
| 95 | Stampede Cr. (UM) | 1 Sep 84  | 12-02       | 0                                 | 3                                 |                                 | 7                                     | 45                                      | 55                  | 0                                     |
| 96 | Stampede Cr. (UM) | 1 Sep 84  | 22-03       | 0                                 | 8                                 |                                 | 4                                     | 0                                       | 12                  | 0                                     |
| 97 | Stampede Cr. (UM) | 15 Sep 84 | 08-01       | 0                                 | 6                                 |                                 | 2                                     | 1                                       | 9                   | 0                                     |
| 98 | Stampede Cr. (UM) | 15 Sep 84 | 13-04       | 0                                 | 2                                 |                                 | 1                                     | 0                                       | 3                   | 0                                     |

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| 1      | 2                 | 3          | 4     | 103         | 104         | 105        | 106  | 107     | 108        | 109         |
|--------|-------------------|------------|-------|-------------|-------------|------------|------|---------|------------|-------------|
| STREAM | DATE              | SAMPLE LOC |       | Trichoptera | Trichoptera | Arthropoda |      | Insecta | Arthropoda | Non-insecta |
|        |                   |            |       | Rhyacoptera | TOTAL       | Crustacea  |      | TOTAL   | TOTAL      | TOTAL       |
|        |                   |            |       | TOTAL       |             | TOTAL      |      |         |            |             |
| 5      | Eldorado Cr. (UM) | 16 Jun 84  | 26-04 |             |             | 0          | 115  | 4942    | 5136       | 275         |
| 6      | Eldorado Cr. (UM) | 16 Jun 84  | 02-02 |             |             | 1          | 137  | 1489    | 1659       | 200         |
| 7      | Eldorado Cr. (UM) | 16 Jun 84  | 06-04 |             |             | 0          | 868  | 1453    | 2393       | 1071        |
| 8      | Eldorado Cr. (UM) | 16 Jun 84  | 04-05 |             |             | 0          | 2    | 1122    | 1126       | 4           |
| 9      | Eldorado Cr. (UM) | 30 Jun 84  | 13-04 |             |             | 0          | 134  | 3853    | 3987       | 136         |
| 10     | Eldorado Cr. (UM) | 30 Jun 84  | 08-04 |             |             | 0          | 732  | 1275    | 2022       | 807         |
| 11     | Eldorado Cr. (UM) | 30 Jun 84  | 01-00 |             |             | 2          | 600  | 6979    | 7863       | 893         |
| 12     | Eldorado Cr. (UM) | 30 Jun 84  | 20-03 |             |             | 1          | 4    | 1842    | 1866       | 26          |
| 13     | Eldorado Cr. (UM) | 23 Jul 84  | 30-09 |             |             | 2          | 861  | 1982    | 2866       | 978         |
| 14     | Eldorado Cr. (UM) | 23 Jul 84  | 24-02 |             |             | 0          | 59   | 3878    | 3944       | 71          |
| 15     | Eldorado Cr. (UM) | 23 Jul 84  | 05-04 |             |             | 15         | 0    | 7965    | 8224       | 706         |
| 16     | Eldorado Cr. (UM) | 23 Jul 84  | 18-04 |             |             | 1          | 424  | 3488    | 4012       | 580         |
| 17     | Eldorado Cr. (UM) | 12 Aug 84  | 12-01 |             |             | 0          | 459  | 5550    | 6059       | 556         |
| 18     | Eldorado Cr. (UM) | 12 Aug 84  | 14-03 |             |             | 0          | 932  | 10303   | 11295      | 1069        |
| 19     | Eldorado Cr. (UM) | 12 Aug 84  | 26-02 |             |             | 5          | 981  | 5073    | 6131       | 1213        |
| 20     | Eldorado Cr. (UM) | 12 Aug 84  | 08-03 |             |             | 0          | 267  | 741     | 1016       | 325         |
| 21     | Eldorado Cr. (UM) | 2 Sep 84   | 03-02 |             |             | 10         | 808  | 1581    | 2443       | 1067        |
| 22     | Eldorado Cr. (UM) | 2 Sep 84   | 29-03 |             |             | 2          | 1008 | 5264    | 6361       | 1291        |
| 23     | Eldorado Cr. (UM) | 2 Sep 84   | 21-01 |             |             | 0          | 308  | 4592    | 4976       | 554         |
| 24     | Eldorado Cr. (UM) | 2 Sep 84   | 08-02 |             |             | 9          | 649  | 1076    | 1777       | 817         |
| 25     | Eldorado Cr. (UM) | 16 Sep 84  | 19-07 |             |             | 0          | 578  | 166     | 746        | 820         |
| 26     | Eldorado Cr. (UM) | 16 Sep 84  | 11-09 |             |             | 5          | 926  | 2602    | 3567       | 1059        |
| 27     | Eldorado Cr. (UM) | 16 Sep 84  | 06-02 |             |             | 0          | 899  | 467     | 1382       | 1002        |
| 28     | Eldorado Cr. (UM) | 16 Sep 84  | 02-02 |             |             | 10         | 1134 | 1704    | 2885       | 1348        |
| 29     | Eldorado Cr. (M)  | 16 Jun 84  | 06-04 |             |             | 0          | 0    | 81      | 81         | 0           |
| 30     | Eldorado Cr. (M)  | 16 Jun 84  | 12-04 |             |             | 0          | 0    | 13      | 14         | 1           |
| 31     | Eldorado Cr. (M)  | 16 Jun 84  | 15-01 |             |             | 0          | 0    | 12      | 12         | 0           |
| 32     | Eldorado Cr. (M)  | 16 Jun 84  | 23-01 |             |             | 0          | 2    | 14      | 16         | 3           |
| 33     | Eldorado Cr. (M)  | 30 Jun 84  | 23-03 |             |             | 0          | 0    | 60      | 60         | 0           |
| 34     | Eldorado Cr. (M)  | 30 Jun 84  | 00-02 |             |             | 0          | 0    | 40      | 40         | 1           |
| 35     | Eldorado Cr. (M)  | 30 Jun 84  | 18-02 |             |             | 0          | 0    | 20      | 20         | 0           |
| 36     | Eldorado Cr. (M)  | 30 Jun 84  | 05-04 |             |             | 0          | 0    | 18      | 18         | 0           |
| 37     | Eldorado Cr. (M)  | 23 Jul 84  | 01-02 |             |             | 0          | 4    | 131     | 138        | 10          |
| 38     | Eldorado Cr. (M)  | 23 Jul 84  | 02-04 |             |             | 0          | 3    | 203     | 210        | 7           |
| 39     | Eldorado Cr. (M)  | 23 Jul 84  | 27-01 |             |             | 0          | 0    | 75      | 75         | 3           |
| 40     | Eldorado Cr. (M)  | 23 Jul 84  | 01-04 |             |             | 0          | 1    | 56      | 59         | 5           |
| 41     | Eldorado Cr. (M)  | 12 Aug 84  | 07-04 |             |             | 0          | 3    | 42      | 45         | 4           |
| 42     | Eldorado Cr. (M)  | 12 Aug 84  | 13-01 |             |             | 1          | 15   | 43      | 58         | 17          |
| 43     | Eldorado Cr. (M)  | 12 Aug 84  | 26-03 |             |             | 1          | 1    | 55      | 57         | 5           |
| 44     | Eldorado Cr. (M)  | 12 Aug 84  | 10-01 |             |             | 0          | 0    | 56      | 56         | 1           |
| 45     | Eldorado Cr. (M)  | 2 Sep 84   | 02-02 |             |             | 0          | 1    | 112     | 113        | 8           |
| 46     | Eldorado Cr. (M)  | 2 Sep 84   | 08-03 |             |             | 0          | 0    | 38      | 38         | 0           |
| 47     | Eldorado Cr. (M)  | 2 Sep 84   | 01-05 |             |             | 0          | 1    | 131     | 132        | 5           |
| 48     | Eldorado Cr. (M)  | 2 Sep 84   | 13-02 |             |             | 1          | 2    | 96      | 99         | 16          |
| 49     | Eldorado Cr. (M)  | 16 Sep 84  | 09-04 |             |             | 0          | 3    | 149     | 152        | 8           |
| 50     | Eldorado Cr. (M)  | 16 Sep 84  | 18-02 |             |             | 0          | 16   | 179     | 197        | 20          |
| 51     | Eldorado Cr. (M)  | 16 Sep 84  | 14-03 |             |             | 1          | 3    | 125     | 128        | 4           |
| 52     | Eldorado Cr. (M)  | 16 Sep 84  | 17-04 |             |             | 0          | 0    | 44      | 44         | 2           |
| 53     | Slate Cr. (M)     | 16 Jun 84  | 01-05 |             |             | 0          | 0    | 18      | 18         | 0           |
| 54     | Slate Cr. (M)     | 16 Jun 84  | 25-05 |             |             | 0          | 11   | 26      | 27         | 1           |
| 55     | Slate Cr. (M)     | 16 Jun 84  | 20-02 |             |             | 0          | 0    | 10      | 10         | 0           |
| 56     | Slate Cr. (M)     | 16 Jun 84  | 23-02 |             |             | 0          | 0    | 16      | 16         | 1           |
| 57     | Slate Cr. (M)     | 30 Jun 84  | 22-03 |             |             | 0          | 0    | 9       | 9          | 0           |
| 58     | Slate Cr. (M)     | 30 Jun 84  | 25-01 |             |             | 0          | 0    | 31      | 31         | 3           |
| 59     | Slate Cr. (M)     | 30 Jun 84  | 02-03 |             |             | 0          | 0    | 17      | 17         | 0           |
| 60     | Slate Cr. (M)     | 30 Jun 84  | 14-02 |             |             | 0          | 0    | 19      | 19         | 0           |
| 61     | Slate Cr. (M)     | 23 Jul 84  | 09-01 |             |             | 0          | 0    | 36      | 36         | 0           |
| 62     | Slate Cr. (M)     | 23 Jul 84  | 28-02 |             |             | 0          | 0    | 212     | 212        | 5           |
| 63     | Slate Cr. (M)     | 23 Jul 84  | 05-04 |             |             | 0          | 0    | 200     | 200        | 0           |
| 64     | Slate Cr. (M)     | 23 Jul 84  | 11-00 |             |             | 0          | 0    | 12      | 12         | 0           |
| 65     | Slate Cr. (M)     | 12 Aug 84  | 22-02 |             |             | 0          | 0    | 19      | 19         | 0           |
| 66     | Slate Cr. (M)     | 12 Aug 84  | 24-03 |             |             | 0          | 0    | 50      | 51         | 3           |
| 67     | Slate Cr. (M)     | 12 Aug 84  | 19-05 |             |             | 0          | 0    | 137     | 137        | 0           |
| 68     | Slate Cr. (M)     | 12 Aug 84  | 01-01 |             |             | 0          | 0    | 16      | 16         | 1           |
| 69     | Slate Cr. (M)     | 2 Sep 84   | 18-03 |             |             | 1          | 2    | 112     | 114        | 5           |
| 70     | Slate Cr. (M)     | 2 Sep 84   | 07-02 |             |             | 0          | 1    | 48      | 49         | 2           |
| 71     | Slate Cr. (M)     | 2 Sep 84   | 14-05 |             |             | 1          | 0    | 34      | 34         | 1           |
| 72     | Slate Cr. (M)     | 2 Sep 84   | 09-02 |             |             | 0          | 0    | 45      | 45         | 0           |
| 73     | Slate Cr. (M)     | 16 Sep 84  | 10-02 |             |             | 0          | 3    | 142     | 145        | 4           |
| 74     | Slate Cr. (M)     | 16 Sep 84  | 03-03 |             |             | 0          | 2    | 138     | 140        | 3           |
| 75     | Slate Cr. (M)     | 16 Sep 84  | 24-04 |             |             | 0          | 1    | 97      | 99         | 4           |
| 76     | Slate Cr. (M)     | 16 Sep 84  | 23-02 |             |             | 0          | 0    | 68      | 67         | 1           |
| 77     | Stampede Cr. (UM) | 17 Jun 84  | 00-02 |             |             | 0          | 0    | 33      | 34         | 1           |
| 78     | Stampede Cr. (UM) | 17 Jun 84  | 09-00 |             |             | 0          | 0    | 10      | 10         | 0           |
| 79     | Stampede Cr. (UM) | 17 Jun 84  | 02-05 |             |             | 0          | 0    | 49      | 49         | 0           |
| 80     | Stampede Cr. (UM) | 17 Jun 84  | 06-02 |             |             | 0          | 0    | 7       | 7          | 0           |
| 81     | Stampede Cr. (UM) | 1 Jul 84   | 06-00 |             |             | 0          | 0    | 109     | 109        | 2           |
| 82     | Stampede Cr. (UM) | 1 Jul 84   | 08-03 |             |             | 0          | 0    | 254     | 254        | 6           |
| 83     | Stampede Cr. (UM) | 1 Jul 84   | 00-01 |             |             | 0          | 0    | 40      | 40         | 0           |
| 84     | Stampede Cr. (UM) | 1 Jul 84   | 29-04 |             |             | 0          | 0    | 348     | 348        | 0           |
| 85     | Stampede Cr. (UM) | 22 Jul 84  | 23-02 |             |             | 0          | 0    | 295     | 296        | 1           |
| 86     | Stampede Cr. (UM) | 22 Jul 84  | 00-04 |             |             | 0          | 0    | 97      | 97         | 1           |
| 87     | Stampede Cr. (UM) | 22 Jul 84  | 05-00 |             |             | 0          | 0    | 119     | 119        | 0           |
| 88     | Stampede Cr. (UM) | 22 Jul 84  | 30-00 |             |             | 0          | 0    | 140     | 140        | 0           |
| 89     | Stampede Cr. (UM) | 11 Aug 84  | 23-04 |             |             | 0          | 0    | 180     | 180        | 1           |
| 90     | Stampede Cr. (UM) | 11 Aug 84  | 22-01 |             |             | 0          | 1    | 155     | 157        | 2           |
| 91     | Stampede Cr. (UM) | 11 Aug 84  | 01-01 |             |             | 0          | 0    | 157     | 157        | 7           |
| 92     | Stampede Cr. (UM) | 11 Aug 84  | 02-04 |             |             | 0          | 0    | 93      | 93         | 0           |
| 93     | Stampede Cr. (UM) | 1 Sep 84   | 17-04 |             |             | 0          | 0    | 114     | 114        | 0           |
| 94     | Stampede Cr. (UM) | 1 Sep 84   | 28-04 |             |             | 0          | 0    | 158     | 158        | 7           |
| 95     | Stampede Cr. (UM) | 1 Sep 84   | 12-02 |             |             | 0          | 0    | 212     | 212        | 0           |
| 96     | Stampede Cr. (UM) | 1 Sep 84   | 22-03 |             |             | 0          | 0    | 164     | 164        | 4           |
| 97     | Stampede Cr. (UM) | 15 Sep 84  | 08-01 |             |             | 0          | 0    | 124     | 125        | 4           |
| 98     | Stampede Cr. (UM) | 15 Sep 84  | 13-04 |             |             | 0          | 0    | 65      | 65         | 1           |



| 1   | 2                | 3         | 4           | 103         | 104         | 105        | 106   | 107     | 108        | 109         |
|-----|------------------|-----------|-------------|-------------|-------------|------------|-------|---------|------------|-------------|
| 1   | STREAM           | DATE      | SAMPLE LOC. | Trichoptera | Trichoptera | Arthropoda |       | Insecta | Arthropoda | Non-Insects |
| 2   |                  |           |             | Rhyacophila | TOTAL       | Crustacea  |       | TOTAL   | TOTAL      | TOTAL       |
| 3   |                  |           |             | TOTAL       |             | TOTAL      |       |         |            |             |
| 4   |                  |           |             |             |             |            |       |         |            |             |
| 99  | Stampede Cr (UM) | 15 Sep 84 | 30-03       |             | 0           | 0          |       | 174     | 174        | 7           |
| 100 | Stampede Cr (UM) | 15 Sep 84 | 24-01       |             | 0           | 0          |       | 156     | 156        | 1           |
| 101 | Stampede Cr (M)  | 17 Jun 84 | 08-00       |             | 0           | 0          |       | 23      | 23         | 0           |
| 102 | Stampede Cr (M)  | 17 Jun 84 | 22-00       |             | 0           | 0          |       | 9       | 9          | 0           |
| 103 | Stampede Cr (M)  | 17 Jun 84 | 03-04       |             | 0           | 0          |       | 7       | 7          | 1           |
| 104 | Stampede Cr (M)  | 17 Jun 84 | 00-03       |             | 0           | 0          |       | 4       | 6          | 2           |
| 105 | Stampede Cr (M)  | 1 Jul 84  | 21-01       |             | 0           | 0          |       | 53      | 53         | 2           |
| 106 | Stampede Cr (M)  | 1 Jul 84  | 00-02       |             | 0           | 2          |       | 103     | 105        | 2           |
| 107 | Stampede Cr (M)  | 1 Jul 84  | 26-03       |             | 0           | 0          |       | 31      | 31         | 0           |
| 108 | Stampede Cr (M)  | 1 Jul 84  | 06-04       |             | 0           | 1          |       | 4       | 5          | 2           |
| 109 | Stampede Cr (M)  | 22 Jul 84 | 25-04       |             | 0           | 0          |       | 48      | 48         | 0           |
| 110 | Stampede Cr (M)  | 22 Jul 84 | 23-03       |             | 0           | 1          |       | 68      | 70         | 3           |
| 111 | Stampede Cr (M)  | 22 Jul 84 | 21-05       |             | 0           | 0          |       | 115     | 116        | 1           |
| 112 | Stampede Cr (M)  | 22 Jul 84 | 13-02       |             | 0           | 0          |       | 61      | 61         | 9           |
| 113 | Stampede Cr (M)  | 11 Aug 84 | 30-03       |             | 0           | 0          |       | 49      | 50         | 1           |
| 114 | Stampede Cr (M)  | 11 Aug 84 | 02-04       |             | 0           | 0          |       | 200     | 200        | 4           |
| 115 | Stampede Cr (M)  | 11 Aug 84 | 29-02       |             | 0           | 0          |       | 92      | 92         | 4           |
| 116 | Stampede Cr (M)  | 11 Aug 84 | 22-03       |             | 0           | 0          |       | 149     | 151        | 3           |
| 117 | Stampede Cr (M)  | 1 Sep 84  | 19-02       |             | 0           | 0          |       | 98      | 98         | 3           |
| 118 | Stampede Cr (M)  | 1 Sep 84  | 21-04       |             | 0           | 0          |       | 119     | 119        | 4           |
| 119 | Stampede Cr (M)  | 1 Sep 84  | 12-02       |             | 0           | 0          |       | 179     | 179        | 4           |
| 120 | Stampede Cr (M)  | 1 Sep 84  | 18-06       |             | 0           | 0          |       | 79      | 79         | 10          |
| 121 | Stampede Cr (M)  | 15 Sep 84 | 19-03       |             | 0           | 0          |       | 202     | 202        | 1           |
| 122 | Stampede Cr (M)  | 15 Sep 84 | 21-02       |             | 0           | 0          |       | 51      | 51         | 0           |
| 123 | Stampede Cr (M)  | 15 Sep 84 | 13-04       |             | 0           | 1          |       | 180     | 181        | 2           |
| 124 | Stampede Cr (M)  | 15 Sep 84 | 03-03       |             | 0           | 0          |       | 130     | 131        | 7           |
| 125 | Jumbo Cr (UM)    | 18 Jun 84 | 05-06       |             | 0           | 117        |       | 354     | 487        | 149         |
| 126 | Jumbo Cr (UM)    | 18 Jun 84 | 07-08       |             | 1           | 87         |       | 1754    | 1841       | 87          |
| 127 | Jumbo Cr (UM)    | 18 Jun 84 | 03-01       |             | 1           | 255        |       | 371     | 642        | 281         |
| 128 | Jumbo Cr (UM)    | 18 Jun 84 | 02-21       |             | 0           | 785        |       | 1387    | 2271       | 986         |
| 129 | Jumbo Cr (UM)    | 2 Jul 84  | 27-04       |             | 3           | 1937       |       | 698     | 2664       | 1990        |
| 130 | Jumbo Cr (UM)    | 2 Jul 84  | 06-02       |             | 0           | 596        |       | 742     | 1361       | 619         |
| 131 | Jumbo Cr (UM)    | 2 Jul 84  | 30-05       |             | 0           | 803        |       | 451     | 1269       | 841         |
| 132 | Jumbo Cr (UM)    | 2 Jul 84  | 20-07       |             | 0           | 25         |       | 391     | 416        | 47          |
| 133 | Jumbo Cr (UM)    | 21 Jul 84 | 29-03       |             | 0           | 499        |       | 729     | 1269       | 616         |
| 134 | Jumbo Cr (UM)    | 21 Jul 84 | 12-06       |             | 5           | 755        |       | 703     | 1507       | 916         |
| 135 | Jumbo Cr (UM)    | 21 Jul 84 | 09-02       |             | 2           | 616        |       | 576     | 1206       | 697         |
| 136 | Jumbo Cr (UM)    | 21 Jul 84 | 24-04       |             | 13          | 1186       |       | 1020    | 2263       | 1331        |
| 137 | Jumbo Cr (UM)    | 13 Aug 84 | 11-03       |             | 2           | 238        |       | 1275    | 1555       | 318         |
| 138 | Jumbo Cr (UM)    | 13 Aug 84 | 06-03       |             | 1           | 47         |       | 327     | 377        | 50          |
| 139 | Jumbo Cr (UM)    | 13 Aug 84 | 04-03       |             | 3           | 447        |       | 600     | 1082       | 600         |
| 140 | Jumbo Cr (UM)    | 13 Aug 84 | 09-05       |             | 0           | 77         |       | 1010    | 1112       | 138         |
| 141 | Jumbo Cr (UM)    | 3 Sep 84  | 14-03       |             | 0           | 20         |       | 134     | 164        | 36          |
| 142 | Jumbo Cr (UM)    | 3 Sep 84  | 28-05       |             | 0           | 77         |       | 474     | 558        | 97          |
| 143 | Jumbo Cr (UM)    | 3 Sep 84  | 11-13       |             | 6           | 184        |       | 157     | 354        | 275         |
| 144 | Jumbo Cr (UM)    | 3 Sep 84  | 25-06       |             | 16          | 1135       |       | 652     | 1849       | 1391        |
| 145 | Jumbo Cr (UM)    | 17 Sep 84 | 06-04       |             | 0           | 105        |       | 483     | 596        | 116         |
| 146 | Jumbo Cr (UM)    | 17 Sep 84 | 12-03       |             | 7           | 144        |       | 446     | 604        | 158         |
| 147 | Jumbo Cr (UM)    | 17 Sep 84 | 07-10       |             | 0           | 11         |       | 79      | 92         | 17          |
| 148 | Jumbo Cr (UM)    | 17 Sep 84 | 15-08       |             | 0           | 15         |       | 88      | 113        | 27          |
| 149 |                  |           |             |             |             |            |       |         |            |             |
| 150 | GRAND TOTAL      |           |             |             | 0           | 129        | 23117 |         | 128080     | 28712       |
| 151 | ELDCOUNT         |           |             |             | 0           | 24         | 24    | 0       |            |             |
| 152 | ELDX/COUNT       |           |             |             | 0           | 24         | 24    | 0       |            |             |
| 153 | SLATE(M) COUNT   |           |             |             | 0           | 24         | 24    |         |            |             |
| 154 | STAMPEDE COUNT   |           |             |             | 0           | 24         | 24    |         |            |             |
| 155 | STAMP(M) COUNT   |           |             |             | 0           | 24         | 24    |         |            |             |
| 156 | JUMBO COUNT      |           |             |             | 0           | 24         | 24    |         |            |             |